JANUARY 31, 1955

NEWS ISSUE

Electrical World

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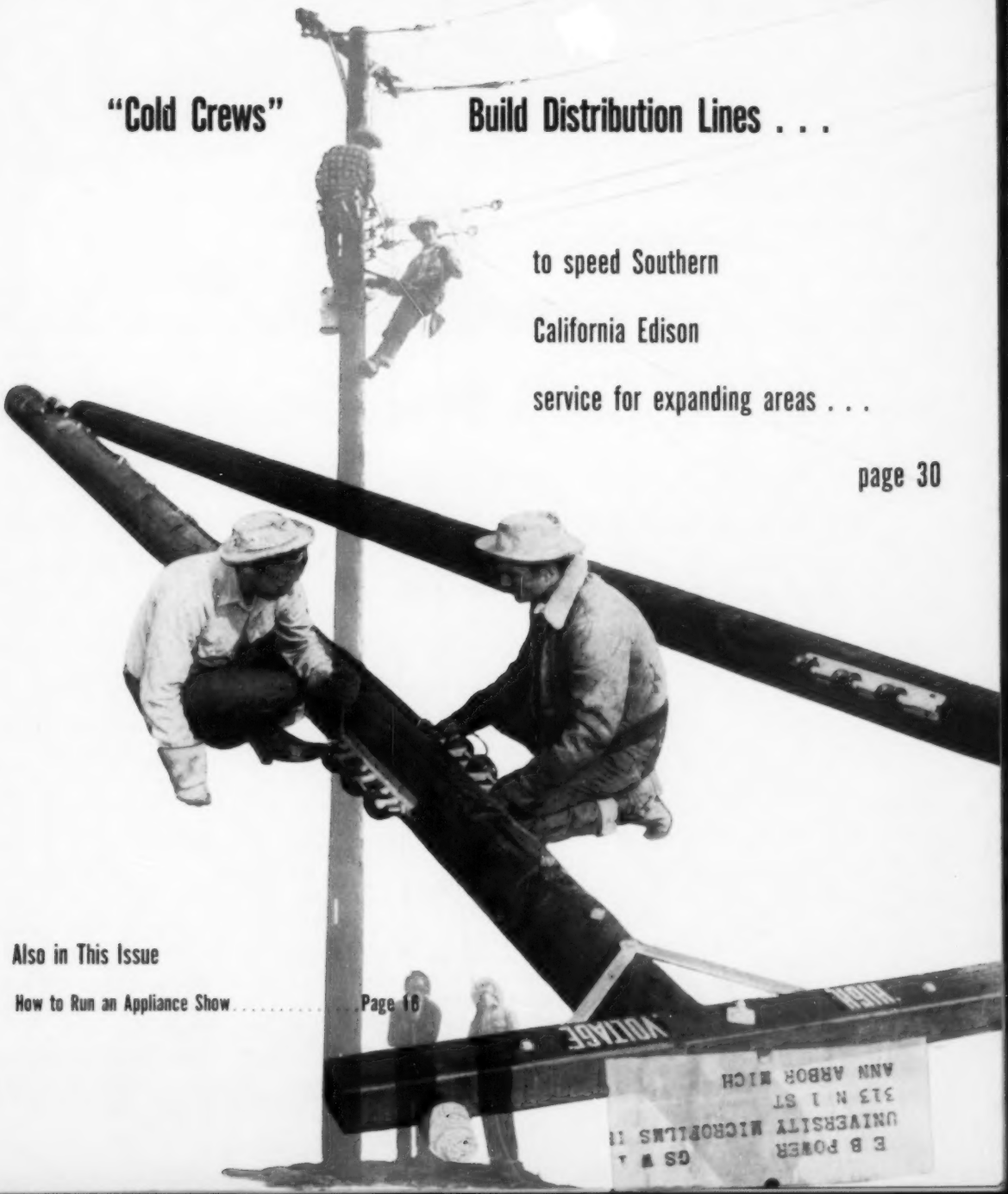
"Cold Crews" Build Distribution Lines . . .

to speed Southern California Edison service for expanding areas . . .

page 30



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How to Run an Appliance Show..... Page 18

E B POWER
UNIVERSITY MICROFILMS
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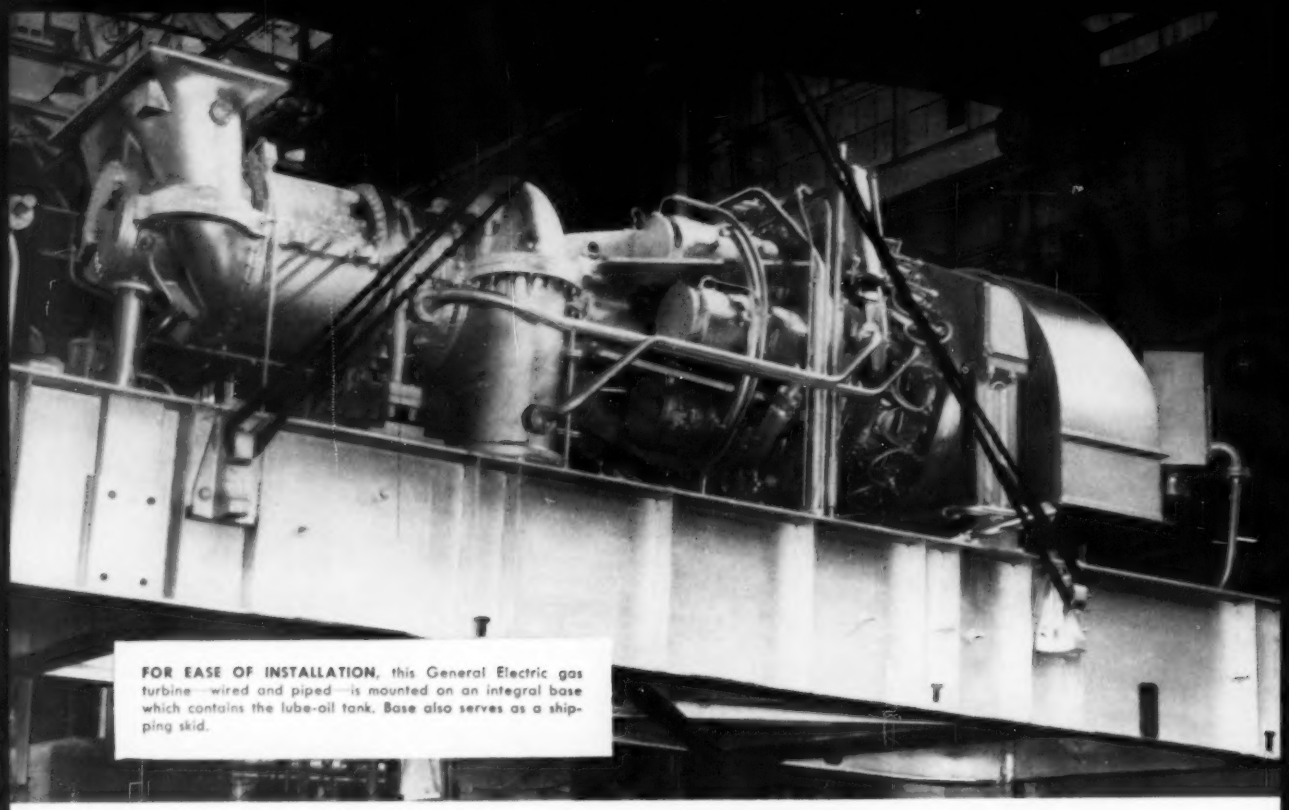
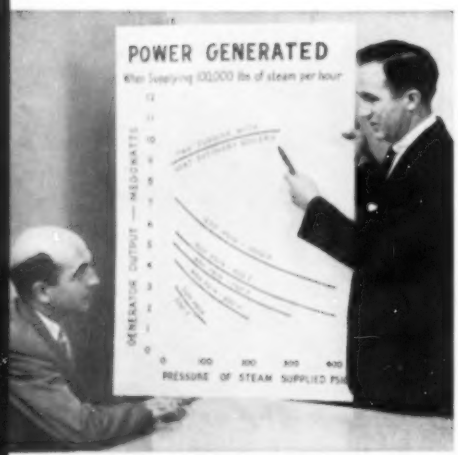


FOR EASE OF INSTALLATION, this General Electric gas turbine—wired and piped—is mounted on an integral base which contains the lube-oil tank. Base also serves as a shipping skid.

Gas turbines can mean new system economies

Operating records confirm that they can boost station capacity and efficiency in combination with steam turbines



IMPROVED PLANT EFFICIENCY results from gas turbine's ability to produce steam with hot exhaust gases. A. G. Mellor, Power Generation Engineer (left) and J. R. Casey, Manager—Gas Turbine Marketing, discuss economies resulting from obtaining steam from gas turbines for use in steam turbine cycles.

Field reports on gas turbine performance plus recent design advances add up to a new approach for many electric utilities to improve efficiency at attractively low dollar investment per kilowatt.

GAS-STEAM TURBINE CYCLE

Simple cycle gas turbines can be used in combination with steam turbines, where the hot exhaust gases from the gas turbine are reclaimed in a recuperator to heat the feed water in the steam cycle. This offers the possibility of increasing station capacity beyond the rating of the gas turbine and increasing station efficiency. In the Rio Pecos station on West Texas Utilities' system, for example, a 5000-kw unit advanced station capacity by 6611 kw, lowering station heat rate by 15.2 percent at the same time.

NEW TECHNOLOGICAL ADVANCES

General Electric has built and installed 17 gas turbine units in electric utility plants. This is over 90 percent of the gas-turbine generators in use today in this country's utility industry, and it represents an unequalled fund of design and field experience. This expensive practical background has resulted in improved designs and reduced installation costs. Gas turbines now can be used for small and medium base-load plants, end-of-line generation, standby, and peak-load stations, as well as topping units.

Most utilities are confronted with the need to step up system capacity and efficiency. In looking for an answer, recently the question has been asked, "What about the gas turbine?" More and more, the answer, based on technological advances and performance reports, is "Sounds good! Let's investigate." Ask your G-E Apparatus Sales representative for details on how the gas turbine can fit into your utility expansion programs, or write General Electric Co., Section 301-283, Schenectady 5, N. Y.

MORE POWER TO AMERICA

GENERAL ELECTRIC

Electrical World

Vol 143 No 5 January 31, 1955

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COMING NEXT WEEK—*What happens when two superhighways are cut simultaneously through the heart of a company's service area? Rockland Light & Power Co will supply the answer in a story of interest to top executives as well as to transmission and distribution engineers.*

Published for 81 years for those engaged in the business of generating, transmitting, distributing, or applying electric power

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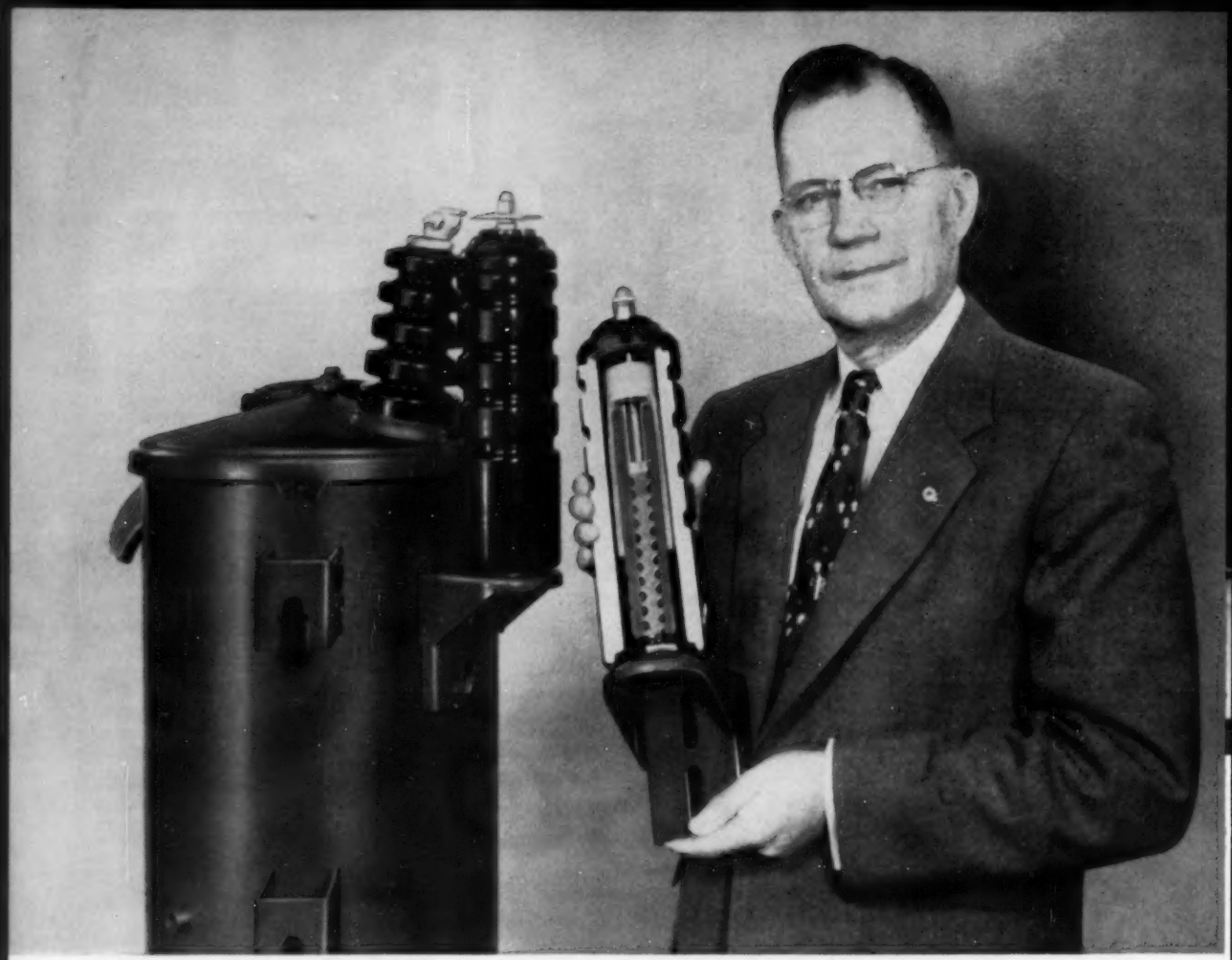
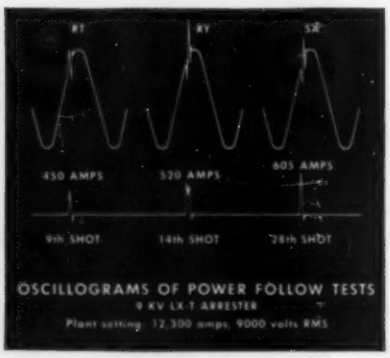


W. A. Sumner, Manager, Distribution Transformer Engineering, explains this

FACT: New Valvex expulsion arrester has greater current-limiting ability



Inherently dependable, the new LX-T retains the time-proved features of De-ion® expulsion arresters... large surge-current ability, low discharge voltage, long life, and ability to handle surges at 60 cycles overvoltages. Now it also incorporates new, low, spark-over voltages with greatly increased current-limiting ability for dynamic current on repeated tests at maximum severity.

It's another feature that spells more for your transformer dollar when you buy Westinghouse.

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EDITORIALS

A Bigger Role for NAWB

The past year was a big one for adequate wiring. The barrage of national trade and consumer advertising, the wide-spread publicity, and locally the promotional programs and wiring finance plans carried out by utilities and electric leagues made it adequate wiring's year of arrival.

Now that it has its start, it is going to require even more intensive push and most important of all, direction if we are to succeed in updating America's wiring systems. This means a job for some one agency.

The logical choice is the National Adequate Wiring Bureau, founded in 1937 by National Electrical Manufacturers Association, and sponsored in cooperation with other national organizations. Among those are Edison Electric Institute, National Electrical Contractors Association, National Association of Electrical Distributors and International Association of Electrical Leagues. The Bureau has been instrumental in bringing the adequate wiring picture into the focus it has today. NEMA has performed a real service in recognizing the wiring problem so early and in providing the financial support for nurturing and developing the Bureau as it has through the years.

NAWB, by virtue of its long experience, is well equipped to give the direction and coordination needed in future national wiring promotion. It could build an effective field force to give assistance in local areas. It could truly become the whole industry's base of operations for the all-out wiring campaign that is shaping up.

Under the present setup, the Bureau draws its funds solely from dues of NEMA members, some of whom have little direct interest in its aims and accomplishments. It is unfair to expect NEMA to finance a greatly expanded sales promotion and educational campaign that is badly needed. All other segments of the industry—individually or through their trade associations—should help finance this effort in a way that will greatly broaden its scope and enhance its usefulness.

It is to NEMA's credit that the Bureau is sought out as the nucleus for an industry-wide adequate wiring drive. It is up to the other segments of the industry to help support the expanded activity that is now essential.

"Hard Sell" Has Arrived

Creative selling—you hear the plea for it everywhere.

But what exactly is creative selling? What must the utility do to sell creatively? What must it do to help dealers move more goods? A good example is laid before you on page 16 in this issue: Pacific Power & Light Co's slick, sales-getting appliance shows.

Still other creative how-to's were spelled out by General Electric Co's George Bogard in a speech last week before the Central Texas Municipal Utilities Institute. He said in effect that utilities must open up, provide the dealer and consumer with more promotional and merchandising services. Among his suggestions:

1. Provide free installation and free home trials of electric dryers.

2. Offer cash bonuses—enough to pay for a water pump—to rural customers who buy a water heater in combination with one other appliance.

3. Encourage all-electric kitchens in new homes by paying a builder a $75 bonus for a home with a 100-amp service switch.

Too much "hard sell" for your kind of operation you say? Too much money involved?

Perhaps there is. All of these techniques are extreme to say the least when measured by what most present day utility practices permit. Nonetheless, all of them have been used by several utilities, and used successfully.

Whether or not your own utility can go this far is not the point. The important thing is the imaginative "Think Big" promotional planning that goes into devising such plans.

The time has come when "hard sell" must replace the passive institutional. Industry everywhere realizes it more and more. You needn't look further than to the once-sanctimonious savings bank to prove it.

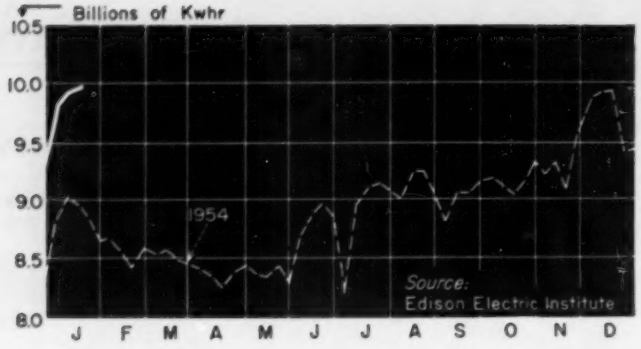
Indiana Order

The order issued by the Indiana Public Service Commission on accounting for liberalized depreciation under the new tax law (p 9) assures electric utilities equal treatment with other industries. The method approved is in line with recommendations made by this magazine (EW, Oct. 25, '54, p 10) and will aid expansion of the industry.

By allowing utilities to normalize tax deferrals, the method also gives a fair break to present and future utility customers. Other state and federal regulatory commissions would be well advised to study the Indiana order as a guide to decisions which must be made in this field which is of vital interest to the utility industry.

THE ELECTRICAL WEEK

LAST MINUTE



Week Ended Jan. 22

9,981,000,000

Up 11.2%

Per Cent Change From Previous Year

	Total US	New Eng.	Mid. Atlan.	Cent. Ind.	West Cent.	South-east	South Cent.	Rocky Mount.	Pacific NW	Pacific SW
Jan. 22	+11.2	+3.9	+4.6	+9.4	+3.0	+25.5	+8.5	+7.3	+5.0	+10.0
Jan. 15	+10.1	+2.9	+3.1	+8.0	+2.5	+22.2	+8.5	+7.8	+11.9	+7.9
Jan. 8	+11.4	+4.0	+5.1	+9.2	+5.2	+21.0	+12.6	+10.9	+13.4	+9.6

Seasonally Adjusted Index† 181.1 Week Ago 179.6 Year Ago 162.7

The Issue's News Highlights . . . Report of Langer subcommittee attacking Dixon-Yates contract as example of "new monopoly movement" brought prompt replies from industry leaders concerned in defense of the contract and their operations . . . Indiana Public Service Commission has issued first order authorizing appropriated surplus accounting for accelerated depreciation . . . Joint Atomic Energy Committee is ready to start hearings to find out how atomic energy law is working out.

America's private electric utilities "accept the co-ops now as a permanent and necessary segment of the power industry," according to Fred H. Strong, deputy REA Administrator. Addressing an organizational meeting of Inter-Industry Farm Electric Utilization Council in Louisville, he said formation of council has been a "grass roots" movement. It indicates that disputes between private and rural public power groups may be at an end, he added.

Number of state legislatures are considering bills of interest to utilities. Measures introduced in Arkansas legislature would: **(1)** Empower the PSC to rule on temporary as well as permanent rate increases; **(2)** permit electric co-ops to enter into sale agreements and interchange of power with persons, corporations, and public agencies without restrictions; **(3)** amend the law defining rural areas to include cities or towns with 2,500 or less population and keep co-ops from being ousted from such territory in event the community is enlarged.

Ohio legislature has received bills to: **(1)** Remove administrative authority from PUC members and place it in hands of a $10,000-a-year public service administrator appointed by the governor; **(2)** provide for a "fair value" public utility rate-fixing formula for the state . . . In Indiana, a bill has been introduced to repeal the Public Utility Arbitration Act requiring compulsory arbitration of labor disputes.

Savannah Electric & Power Co gets Georgia PSC approval to cut rates, mainly commercial, about $112,000 a year, effective Feb. 1 . . . Michigan PSC approves slightly higher rates for Detroit Edison in billing companies using electricity in metal melting furnaces . . . Utah PSC approves $69,000-a-year rate increase for Southern Utah Power.

William Dubilier, founder of Cornell-Dubilier Electric Corp, has been selected as first recipient of first annual Gano Dunn Medal for "outstanding professional achievement." Award will be made at Annual Founder's Day Dinner of Cooper Union Alumni Association, Feb. 12.

NEWS OF THE INDUSTRY BRIEFLY TOLD

Off the Washington Wire . . . Report of Secretary of Commerce on cost of utilities relocation in President's new highway program is due in Congress Feb. 1 . . . Chairman John B. Conly has called meeting for Feb. 10 of NARUC committee on legislation to amend the Federal Power Act.

AEC's 17th semiannual report shows total U. S. investment in atomic program at June 30, 1954, of over $13 billion . . . AEC Chairman Lewis Strauss has hired Everett Holles, former CBS news analyst, as personal assistant to improve his relations with Congress and the public . . . Business and Defense Services Administration has named William M. Firshing, executive assistant to the vice president, Babcock & Wilcox's Boiler Division, director of Power Equipment Division.

Private development of Niagara power is expected to receive early support of politically powerful Association of Towns, according to Empire State Chamber of Commerce . . . New York's Gov Averell Harriman has announced full support of Sen Herbert Lehman's proposal to permit State Power Authority to build transmission lines for St. Lawrence and Niagara power.

TVA has placed in service new 127-mile microwave radio relay link between Chattanooga, the Kingston Steam Plant, and Knoxville. Agency now has 500 miles of microwave channels . . . J. D. Stietenroth, former secretary-treasurer of Mississippi P&L, is now a "utility analyst" with R. W. Beck & Associates of Seattle, Wash. Firm is retained by co-ops and municipal power systems throughout country. Stietenroth will be assigned to Beck's Columbus, Neb., office.

Insulating oil must have better understood nomenclature and new testing procedures to guarantee suitability for modern electrical equipment, F. C. Doble told client conference last week . . . Cleveland Electric Illuminating's Pres Elmer L. Lindseth was to leave last week for Belgian Congo with party of five to study area development . . . IBEW-AFL has purchased majority interest in American Standard Life Insurance Co of Washington, D. C. . . . U. S. Weather Bureau's Jerome Namias says evidence is piling up to indicate that distortion of East's climatic region makes it advisable to consider entire Atlantic seaboard as a hurricane area.

ABOUT PEOPLE IN THE INDUSTRY

In reply to critics of revised Atomic Energy Act, Rep W. Sterling Cole (R-N. Y.) told N. Y. State Bankers Association: "Real way to do American taxpayer a disservice would be by keeping private capital out of atomic energy at this time. Real way to create atomic giveaway would be by requiring government to take on complete burden of perfecting atomic power reactors, and then inviting private capital into the field at some future date when fair returns on money invested will be much more probable."

American industry eventually "is going to build up an investment, particularly in research and development, which must match that already produced by the government," according to Francis K. McCune, General Electric Co vice president. In radio broadcast he said new Atomic Energy Act is "step toward harnessing initiative and enterprise of American business" in achieving peacetime usefulness of atomic energy and increased military strength.

More News About People page 36

Langer's Attack on Dixon-Yates . . .

The Democratic political storm over Dixon-Yates picked up in Congress last week. Seeking by whatever means possible to cancel the contract, its foes are now attacking on the basis that it is a "dramatic" example of a "new monopoly movement."

This finding came from the Senate's anti-monopoly subcommittee in a voluminous report to Congress. Providing the majority opinion in the report were such Dixon-Yates foes as Senators William Langer (R-N. D.), Estes Kefauver (D-Tenn.), and Harley Kilgore (D-W. Va.). Sen Everett Dirksen (R-Ill.), will file minority views.

Report Adds Fuel to Democratic Fire . . . The 115-page report blasted the contract and aims to use it as a springboard for recommended investigations of electric utilities' public relations and political tie-ups, of the situation in the Pacific Northwest and the Niagara-St. Lawrence area, and of marketing of Clark Hill Dam power.

In lashing out at the Dixon-Yates contract as "a dramatic manifestation of the new monopoly movement" in the electric power industry, it fans the fire the Democrats have been trying to build. Among the findings are:

- A suggestion for a "careful review in terms of the realities of our contemporary economic life" of antitrust and monopoly laws and their enforcement. The report said its hearings on Dixon-Yates and other power matters last year demonstrated a failure of state regulation of power companies and of failure of the Public Utility Holding Company Act of 1935 to protect the public.

The report said the nation is in the midst of the "third great corporate merger movement" in its history, and warned of economic disaster unless the trend is checked.

- A finding, based on hearings during the last Congress, that (1) "there is a two-pronged drive by private monopoly to destroy public competition in the power business and that the Dixon-Yates contract is a part of that drive, and (2) that Wall Street domination of the power industry has revived many of the holding company evils which Congress sought by legislation to suppress."
- A finding that Middle South Utilities, Inc, subsidiaries had interfered in state politics, that they "showed excessive overhead in advertising" and that such activities are typical of other private electric power companies.
- A finding that there is "Wall Street domination" of Middle South and its operating subsidiaries.
- Recommendations that investiga-

Brings Quick Reply from the Industry

Following are comments from key industry leaders upon release of the Langer subcommittee report:

Edgar H. Dixon, president of Middle South Utilities:

"I feel confident of the ability of the United States Senate and the American public to appraise this interim report in its proper perspective.

"The record will show that the hearings conducted by this subcommittee (frequently with only a single committee member present) insofar as they related to the Dixon-Yates power contract, were dominated by those favoring government ownership of public utilities. No witness was heard who had been directly associated with the making of the proposal or negotiation of the contract.

"Middle South Utilities, Inc, was created a little more than five years ago. . . . It has operated during its entire corporate lifetime under this federal statute [Public Utility Holding Company Act of 1935] and its corporate actions have been fully and publicly disclosed.

"Charges of wrongdoing made by witnesses before the subcommittee have been investigated by various federal agencies and to the best of our knowledge such charges were not supported by fact . . ."

E. A. Yates, Chairman of Southern Co:

"There is no substance to the charges made against The Southern Co in the report issued by Senators Langer, Kefauver and Kilgore. The so-called Dixon-Yates contract for the West Memphis power plant has been exhaustively studied by all federal agencies concerned and each has found it to be a sound contract and in public interest. . . .

"References in the report to 'monopoly' in Southern Co territory as in Georgia are of course ridiculous. In Georgia, as in Tennessee or any other state, utilities have franchise areas in which they alone serve. There are 93 government-financed or government-owned electrical power suppliers in Georgia with such service areas. The privately owned utilities are effectively regulated by state, local, and federal authorities, whereas no such regulation exists in the case of government-financed or government-owned utilities."

George G. Walker, president of Electric Bond & Share Co:

"Neither Bond & Share nor Ebasco Services controls, directly or indirectly, any company operating in the United States. Neither one owns a single share of stock in any electric power company in the United States.

"No individual or institution, or group of individuals or institutions, controls Bond & Share or Ebasco directly or indirectly. Bond & Share has 36,000 shareholders, none owns as much as 2%.

"We have been, for more than 16 years and still are, subject to the jurisdiction of the Securities and Exchange Commission and the strict regulations of that federal body. . . ."

tion be instituted of (1) charges that private power companies are attempting to gain control of the hydro resources of the Pacific Northwest, (2) complaints that plans of the New York State Power Authority for marketing electric energy from Niagara-St. Lawrence projects "may serve to strengthen control of private monopoly over the region's power supply," and (3) "the plan entirely to junk the preference for public and cooperative systems in marketing of power from the Clark Hill federal multipurpose project in Georgia."

The subcommittee report clearly recommended further investigations, not limited to the electric utilities field. Pending such studies, it suggested that the Dixon-Yates contract be nullified.

Opposition Action Elsewhere . . . These other actions also took place last week:

- Democrats on the Joint Atomic Energy Committee met to decide whether to issue a 15-page, staff-prepared report attacking last summer's vote of approval on the contract, or a 92-page report prepared by Rep Chet Holifield (D-Calif.), a member of the joint committee and an ardent Dixon-Yates foe.
- Holifield polished his resolution to order cancellation of the AEC contract.
- Democratic members of the appropriations committees prepared to knife $6.5 million from TVA's budget earmarked for transmission lines to pick up Dixon-Yates energy.

Soviet A-Power Plant

The Soviet government has published in Pravda pictures of what that government calls the first atomic energy power station in the world. The three pictures revealed a three-story factory building with a smokestack, a circular installation identified as an atomic reactor and part of the control desk of the plant. Site of the 5,000-kw plant, supposed to have gone into operation last July, was not disclosed. The USSR, which said it would share its knowledge of the plant, plans to present a report on the plant at an international atomic conference to be held by the United Nations in Geneva next August.

Surplus Accounting Method . . .

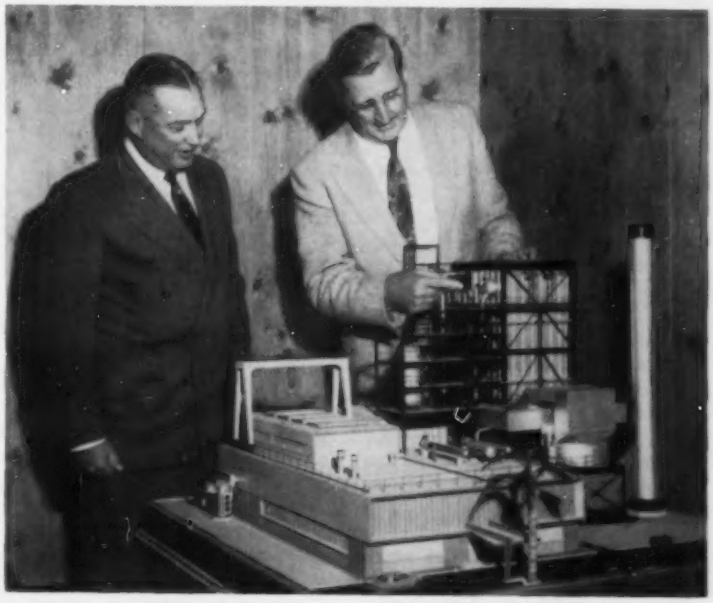
. . . has been approved by the Indiana PSC for the handling of the tax deferral arising from the use of accelerated depreciation

The Public Service Commission of Indiana has approved the normalization of taxes and the use of an appropriated surplus method of accounting for the tax deferral arising from the use of accelerated depreciation.

The order dated Dec. 23, 1954 was in response to a joint petition of the Indiana & Michigan Electric Co, Indianapolis Power & Light Co, Mooresville Public Service Co, Northern Indiana Public Service Co, Public Service Co of Indiana, and Southern Indiana Gas & Electric Co. It was the first order which specified appropriated surplus accounting for accelerated depreciation. This was a departure from the first order on accelerated depreciation which was issued by the Michigan Public Service Commission with respect to Detroit Edison Co and which specified reserve accounting for the tax deferral. In addition, there is still pending before the Federal Power Commission a petition for a declaratory order by the Columbia Gas System which also requested reserve accounting.

The order of the PSC succinctly restated Congressional intent with regard to accelerated depreciation in that its purpose was the stimulation of the national economy through the construction of new facilities and the replacement of old facilities by the provision of funds which will arise as the result of the tax deferral.

The order made the foregoing even



Nevada Plant to Run on Natural Gas

After signing contract for natural gas to fuel new steam plant under construction near Las Vegas, Pres Reid Gardner of Southern Nevada Power Co points out salient features of the plant to H. G. Laub, president of Nevada Natural Gas Pipeline Co.

The first unit of the new plant (44,000 kw) is scheduled to go on the line in December and the contract calls for 11.7 million cu ft of gas per day at that time. When the second unit (60,000 kw) is completed about June 1957, the plant will receive 28 million cu ft of gas per day.

more specific when it said: "The commission further finds that each petitioner has been and now is engaged in the construction and acquisition of major additional utility plant, property, equipment, and related facilities required in its business in order to meet the demands made upon it for utility services in all classifications of use, including industrial and related uses essential for national defense purposes, and in order to provide the funds necessary to finance such construction requirements each petitioner has been and continues to be faced with the necessity of obtaining substantial amounts of new and additional capital through the issue and sale of new and additional securities. Accordingly, to the extent that accelerated depreciation for federal tax purposes will enable petitioners to have funds available for the financing, in part, of their construction requirements, petitioners thereby will be able to defer the issue of a portion of the securities which otherwise would be required if their construction programs are to go forward in orderly fashion without delay, all of which is in the public interest, in the interest of each petitioner, and in the interest of the customers served by each."

No Difference in Fast Write Offs . . . The commission made it clear that it saw no difference between the provisions of accelerated amortization and of accelerated depreciation, either as to economic intent or as to the treatment for accounting purposes. The commission, in prior orders dealing with accelerated amortization, had permitted companies to use normalized taxes and appropriated surplus methods in accounting for the tax deferral.

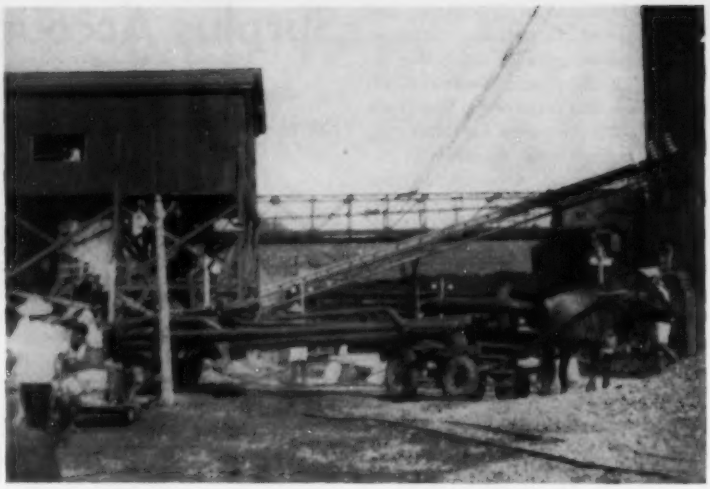
The Ruling . . . Consequently, the commission ruled that a company be permitted:

"(a) To account on its books for that portion of its properties which are the subject of accelerated depreciation pursuant to its election under Section 167 of the Internal Revenue Code of 1954 in the same manner as its other properties, and to accrue depreciation therefor at rates consistent with its rates for like property not subject to accelerated depreciation.

"(b) During those years of the service life of any of its properties which are the subject of accelerated depreciation pursuant to its election under Section 167 of the Internal Revenue Code of 1954, in which a deferral of federal taxes on income results from the use of the accelerated depreciation deduction in lieu of the deduction allowable under the tax depreciation method heretofore followed, to charge to 'Provisions for Deferred Federal Income Taxes,' and to credit to 'Appropriated Surplus Arising from Deferment of Federal Income Taxes' an amount or amounts in total for each year equal to such deferral of taxes.

"(c) Commencing with the year in which its deduction of depreciation for federal tax purposes in respect of any of its properties subject to accelerated depreciation is less than such deduction otherwise would have been if depreciation on such properties had been computed at rates consistent with its rates for like properties not subject to accelerated depreciation, and continuing until 'Appropriated Surplus Arising from Deferment of Federal Income Taxes,' applicable to such properties, is exhausted, or such properties are retired from service, to charge to 'Appropriated Surplus Arising from Deferment of Federal Income Taxes' and to credit to 'Portion of Current Federal Income Taxes Deferred in Prior Years' an amount or amounts in total for each year equal to the increase in federal taxes on income resulting from such lower Federal tax depreciation deduction."

The Indiana Commission noted that the order was for accounting purposes only.



Chinese Use Oxen to Build Formosa Plant

The Chinese are using the "old" and the "new" in constructing the Peipu plant of the Taiwan Power Co. Chinese workmen are pictured above with ox pulling a load of pipe. At Peipu, oxen are being used to transport pipe from docks to plant site.

Taiwan Power, in addition to building the Peipu Plant in the northern part of the island, is also working on another plant at Nanpu in the southern section. Peipu Plant, slated for operation early this year, will produce 40,000 kw from two 20,000-kw units, one of which is operating. When completed the Nanpu Plant will have an output of 200,000 kw from two 40,000-kw units and two 60,000-kw units.

AEC Program Attacked

Alex Radin, general manager of American Public Power Association, last week charged Atomic Energy Commission's new reactor demonstration program is unfair to public power groups. He said April 1 cutoff date for proposals makes it difficult for anyone not already in on AEC program to develop an acceptable design by that date.

Why this cable

means **peace of mind**

RoZone-RoPrene being installed by Pacific Gas & Electric in downtown San Francisco.

PEACE OF MIND comes with the installation of power cable you *know* is good for years of unfailing service.

And, there *are* a few premium quality cables–backed by sound research and experience–on which you can rely for freedom from the nightmare of service outages.

Among the most reliable of these power cables is Rome's service-tested and proven RoZone-RoPrene.

RoZone–premium quality, oil base type insulation gives you–

- High dielectric and impulse strength
- Excellent resistance to corona and ozone cutting
- Excellent long-time electrical stability in water
- Long life (maintains desirable characteristics for many years)
- Versatility (recommended for voltages from 600 to 15,000)
- Guarantee of correct manufacture through the ionization testing of every foot of RoZone-RoPrene rated at 3,000 volts or over.

RoPrene–rugged, widely accepted Neoprene sheath gives you–

- Strength and toughness (abrasion resistance provides maximum mechanical protection)
- Resistant to fire (accepted as standard sheath for mining cable where flame resistance is mandatory requirement of Safety Codes)
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It will pay you to investigate the advantages of this quality cable–RoZone-RoPrene. Write for the Rome Power and Control Cable Catalog. Rome's personalized engineering help is also yours for the asking.

It Costs Less to Buy the Best

ROME CABLE Corporation
ROME · NEW YORK
and
TORRANCE · CALIFORNIA

How NEW DESIGNS

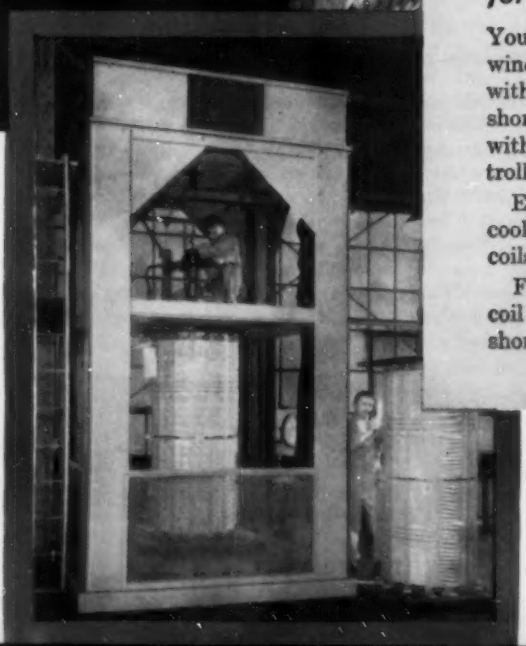
ALLIS-CHALMERS
POWER
Transformers

NEW *No-Splice Continuous Winding for High Voltage Coils*

You get high inherent mechanical strength from continuous winding of high voltage coils that are wound on solid barriers without splicing. They are well-balanced to prevent high short-circuit stresses. Photo above shows how turns are wound with exact degree of tension to make a tight coil. Carefully controlled tension eliminates any possibility of damaging insulation.

Each coil is well ventilated with each conductor exposed to cooling oil. A special snap-lock spacer locks in place between coils to form a uniform cooling duct.

Final step is shown at left. A hydraulic press compresses coil stacks to exact dimensions for further protection against short-circuit stresses.



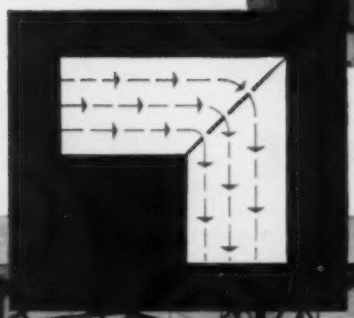
ALLIS-

Improve Power Transformers

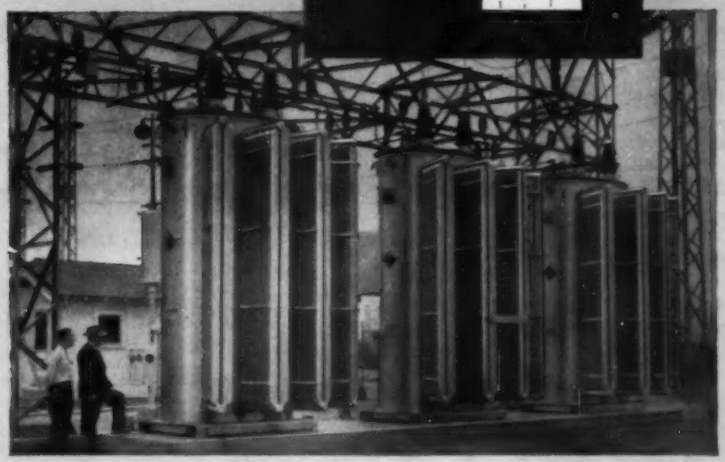
New continuous windings on solid barriers eliminate all splices and assure high mechanical strength of coils on Allis-Chalmers small power transformers . . . snap-lock spacers provide uniform cooling ducts. New mitered core design gets full advantage from modern core steels, reduces exciting current. Here's the full story:

NEW *Mitered Core Design Uses Cold-Rolled Steel*

Transformer exciting current is reduced 50% when mitered core design permits use of best properties of cold-rolled steel. Steel is cut and stacked to take advantage of orientation so that flux flows easily. Mitered core also permits reduction in weights and dimensions.



MITERED DESIGN MINIMIZES AIR GAP between joints, keeps exciting current low. Steel is cut and stacked to take advantage of orientation properties of core steel.



Next time...

you consider power transformers for your system, it will pay to investigate the advanced design and expert workmanship Allis-Chalmers provides. Call a transformer expert from the nearest A-C office or write Allis-Chalmers, Milwaukee 1, Wisconsin for more information.

A-4408

CHALMERS

A-C ALLIS-CHALMERS

to produce an aluminum pig

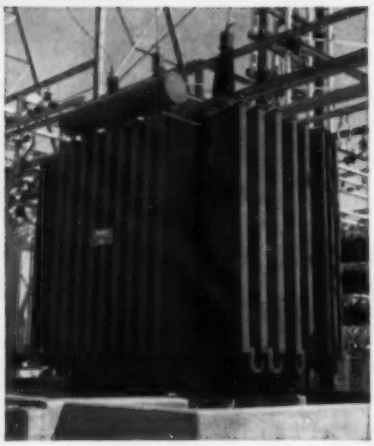
Aluminum, most abundant of all metallic elements on earth, would be one of our rarest metals were it not for the magic of electricity. The production of aluminum is a highly complex electrolytic process.

A major step in this process—the transformation of bauxite into 50 pound aluminum pigs—takes place in huge smelting plants, like the Rockdale, Texas plant of the Aluminum Company of America.

At Rockdale, Wagner transformers play an essential role in this process. This bank of four Wagner Power Transformers was recently installed in the main substation at this plant. Each is rated 25,000/33,333/41,667 kva, 138,000 to 13,800 volts.

Such banks of Wagner Power Transformers can be found at many great industrial plants . . . because they handle their never-ending job of supplying proper voltages for every purpose with great efficiency and dependability.

Let a skilled Wagner engineer discuss your transformer needs with you. Call the nearest of our 32 branch offices, or write us direct.



Here is one of the four Wagner Power Transformers that form the main substation shown above. Each is rated 25,000/33,333/41,667 kva.

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BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

ELECTRIC MOTORS
TRANSFORMERS
INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS—AIR AND HYDRAULIC

WT 55-1

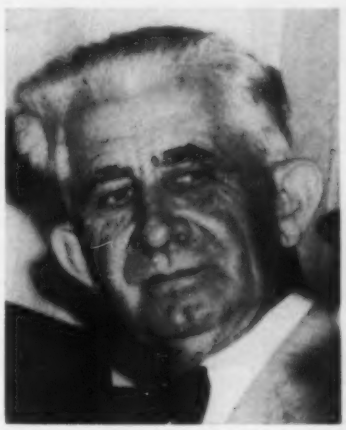
Atomic Energy Hearings Open

Joint Congressional Committee scheduled to start taking testimony today on working of revised atomic energy law

The Joint Congressional Committee on Atomic Energy completed its organization last week and scheduled a series of hearings to see how its new law is working out.

Sen Clinton P. Anderson (D-N.M.) will head the group this session. Rep Carl T. Durham (D-N.C.) is vice chairman. Most of the other 16 members were on the committee last year when the Atomic Energy Act of 1946 was rewritten.

SEN CLINTON P. ANDERSON



REP CARL T. DURHAM

Seeks AEC's Progress Report . . . The Joint Committee wants, first of all, to hear from the Atomic Energy Commission on progress to date on the industrial participation program. It wants Atomic Energy Commission to report on its new demonstration power reactor program, pricing policy for fuels and weapons-grade byproducts, licensing, regulations, dissemination of industrial information, hazards and insurance, patents and compulsory licensing, international agreements, training and organizational changes within AEC.

Four days—Jan. 31, Feb. 1, 2 and 4—will be devoted to AEC testimony on these subjects. An indication of the effectiveness of AEC's own declassification program will be the extent to which the agency discusses heretofore "taboo" topics during the public hearings.

One of the topics AEC officials can be expected to discuss in the hearings beginning today is the problem of "facilities clearance." AEC still must decide what it will require in the way of approved storage facilities for "gray area" atomic data turned over to private firms. Accompanying this is the question of whether—and how many—guards would be required.

During the following week, the committee plans to hear the views of interested industrial and private groups and individuals. It is holding open additional sessions in event others wish to be heard.

Establishes 2 Subcommittees . . . At its organizational meeting, the Joint Committee set up two new subcommittees: Subcommittee on agreements for cooperation and subcommittee on authorizing legislation. The first is concerned with international agreements; the second, with matters relating to AEC acquisition or condemnation of real property and AEC plant or facility acquisition, construction or expansion. Under the new law, Congressional approval of both these activities is required.

Some of the appointments of JCAE members to these subcommittees are notable:

- Rep Carl Durham, only member from North Carolina, is highly interested in getting a training program going, for both domestic and foreign students, which utilizes reactors on university campuses. North Carolina State has the only operating campus reactor in the country. He has been named ranking majority member of the research and development subcommittee and the construction subcommittee.
- Rep Chet Holifield (D-Calif.), most ardent House foe of the Dixon-Yates contract, has been named to head the new authorizing legislation subcommittee. Holifield will thus be in a position to say yes or no to any new AEC requests for government buildings.
- Sen John Bricker (R-Ohio), author of a controversial constitutional amendment to give Congress a veto power over executive agreements with foreign nations, will head the subcommittee on agreements for cooperation. Bricker's amendment failed to pass last session, but he will renew his efforts this year.
- Senators Eugene Millikin (R-Colo.) and Anderson, and Rep John J. Dempsey, a new Joint Committee member, are on the raw materials subcommittee, which will review AEC policy on procurement. Millikin is a partisan of mining interests, and Anderson and Dempsey are both from New Mexico, a big mining state.

Niagara Mohawk Plans 200-Mw Steam Unit

Niagara Mohawk Power Corp will install a 200,000-kw steam generating unit, costing $30 million, at its Huntley plant. The unit, scheduled for completion in 1957, will increase plant capability to over 1 million kw.

In a statement announcing the new unit, Niagara Mohawk Pres Earle J. Machold declared that most of New York State's power requirements are now and will continue to be met by steam power. He pointed out that the new steam unit would be needed even after Niagara and St. Lawrence hydro projects are completed.

Machold expressed confidence Congress would approve development of Niagara power by a "taxpaying business enterprise rather than a government project whose only virtue is ability to avoid all taxes." He said all categories of consumers and taxpayers in the state backed private development.

HOW TO RUN AN APPLIANCE SHOW

ROY VERNSTROM, General Sales Manager, Pacific Power & Light Co, Portland, Ore.

It takes showmanship these days to sell almost anything.

At Pacific Power & Light Co this principle has been applied to appliance selling. If you want to prove that showmanship, combined with mass selling demonstrations, moves goods, builds load, and wins friends, you don't have to look any further than the sales promotion shows PP&L already has staged. But in the process one thing was found. If you don't have a plan, you don't have a show. If it's a good plan and a good show, you'll get your sales. If it's bad, POW!

First, feel out your employees on whether they can use the show's attention-getting, friend-making opportunity to the company's advantage. If they're only lukewarm and aren't anxious to put in time and effort to make it go, then it might not be worth it. A good show, and the results needed to make it pay, must above all have enthusiasm!

Okay, you and your employees like the idea. You're so convinced that you want to call a meeting right away. But wait. First you must have the plan—and a budget. The budget will come from the plan; let's take the plan first and scale it down if necessary. These things you ask yourself as you set down your plan: Where will we have our show? When? What kind of entertainment and how much? What will we ask the dealer to do? How much will it cost him to participate? (These are answered later; so let's get on with the steps you take.)

Screen Your Dealers . . . With the plan and the budget in rough form you call a meeting of electrical appliance dealers, and this brings us to the first problem: Which dealers? Screen your list carefully. Eliminate the fly-by-night. Then, with your dealers in a group tell them about your plan and ask for their enthusiastic cooperation. Here you test your own sales ability by picking up their registration fees. Remember, if you make it too easy, they'll lose interest. If each has his dollars invested, he'll want to be there to make the investment pay.

Now you have plan, budget, and dealer cooperation. It's time to set up your staff. You'll need a local company man to work with dealers to help them construct a successful exhibit. Back him up. He is the front man. He was

EMCEE FOR PP&L SHOWS is Sales Promotion Manager Lee Phillips, a vet radio and stage performer, who moves things at a fast pace

. . . and away we go

Good showmanship will
sell appliances; but
if it's bad, POW!

HOT-STICK DEMONSTRATIONS and other company-generated exhibits afford excellent entertainment, make for good public relations

ENTERTAINMENT should be family type with good gags, music, novelty acts. This show was on television

PAYOFF PART OF SHOW is cooking school and appliance demonstration. Give economists help they need

Appliance Show

there before the show, and he'll be there afterwards. He's the one who will get the praise or the panning.

Where Will You Hold It? . . . Now, physical details. First, is the building close to the business district, easy to find? Does it have a good reputation for successful community ventures? Are there plenty of parking areas nearby? Is the rent reasonable? Be sure the building is available for 48 hr before and after the show so that facilities can be setup and thoroughly checked. Does it have adequate wiring? Is the building served with lines for radio or TV broadcast service? How about seating capacity? It must be adequate, or you've made enemies instead of friends.

And what about ventilation in case you hit a warm summer day, or heating if it's cold? Be quick to find the man who knows about the building whether janitor, caretaker or owner. You know when you start that you'll need a good public address system, because it's the show's greatest asset. Insist that you get an extra microphone. This delicate part of every P.A. system is your biggest potential troublemaker.

Watch Your Gags . . . Entertainment usually makes the show. Be sure it's the family type with no off-color gags or double meaning jokes. They can ruin more public relations in a minute than you can build in a year. To book entertainers, be sure you deal with a reputable agent, and be sure contracts are complete. Make plans, too, for special props, stage preparations, and union stage hands. As for stage and booth construction, they are jobs for an experienced decorator. Don't try to save money with an inadequate handyman.

The Sales Pitch . . . Appliance demonstrations get great response, and they're your best sales effort. Use a home economist employed by your own company. If you invite a distributer or factory economist, she can't be blamed for pitching her own line. Be sure your home economist has a plan and can tell you what equipment she will need. She will need a budget, too, and you should help her find cleanup facilities for her pans, dishes, and equipment. If she's doing a cooking or freezing school, get literature to pass out at each session. And don't overlook the opportunity for a lighting demonstration along with cooking and freezing classes.

Door prizes, small appliances, etc, usually bring good results, especially as crowd getters. Urge dealers to give away items like pot-holders, measuring cups, etc, if they have them available. Prize drawings from individual dealer's booths, however, often start a mild war; so be careful.

Hot-stick demonstrations and pole-top resuscitation can be good entertainment as well as excellent company public relations; use them if you can. Consider, too, other display possibilities such as mobile radio equipment.

Don't Stop Talking . . . Advertising and publicity can be a natural; don't stop talking about the show once you've started. Use all the media you can.

Finally, you'll be hiring several services, and all people and organizations need a close check. Contracts are the only answer. By all means check out your agreements with your legal department. Things like insurance to cover all hazards are details that must be checked in advance through the proper channels.

After the show write a lot of letters to dealers, distributors, the guy who loaned you the ladder, the radio station, everyone who took part. It's the cheapest form of public relations and one of the best.

Then, count your results. Did your dealers sell merchandise? Secure prospects? How much EAR will you show? Follow your own fact-finding with another dealer meeting. Be ready with a complete sales program after you've delivered the facts on what the show has done. Believe it or not, your show will continue to pay off in hepped-up dealer sales and added line load for months or years after the curtains close on the last act.

So hitch up your belt, take a deep breath, and prepare for sleepless nights. Ulcers can be avoided if you make up a good plan and follow it. And when it's done, you'll say you never had so much fun in your life. Why, this is practically show business!

The Results . . . What kind of results is Pacific Power & Light Co getting with its appliance shows? In one small isolated Oregon county used as a guinea pig in its sales experiments, PP&L ran the show and backed it with a month-long sales contest. That was a year ago. Since then range sales in the county have increased 38%, refrigerators 18%, freezers 35%, automatic washers 98%, and electric clothes dryers 60%.

Dealers, too, are pleased with the results. One of them in Hood River Ore., reports he obtained 350 good prospects through his booth at a recent two-day PP&L show. Immediately after he sold 15 major units to people who had registered with him.

Tacoma, State Agency Agree on Fish Program

Tacoma, Wash., has reached an agreement with the Washington State Fisheries Department for a fish-protective program on the South Skokomish River which is described as "unprecedented" by Robert Schoettler, fisheries director.

Schoettler hopes that the pact will set a pattern for resolving fish-passage problems at Northwest hydro dams.

The agreement provides, for the first time, that a comprehensive fish-protective program be developed simultaneously with the design work for a new dam, he said.

"While previous efforts to minimize the effects of a dam largely have been confined to providing fish-passage facilities for adult salmon and supplemental hatchery plantings," Schoettler said, "the Skokomish program will be directed as well toward protecting downstream migrants and maintaining the natural environment at a high fish-growing level."

Tacoma City Light and the state fisheries department have been at odds over two other proposed dams on the Cowlitz River but appear presently to be on friendlier terms. The Skokomish project calls for construction of a dam to divert flow to Tacoma's existing Cushman power plant.

One phase of the fish-study project, costing the city a total of $23,000, will cover environmental conditions now existing in the Skokomish River system, including spawning-ground surveys, water flows and temperatures, and migratory patterns of the three species of salmon which originate from the river.

NEW
functional appearance

NEW
improved ventilation

NEW
bracket construction

NEW
dripproof protection

...keep Elliott out ahead in large 4-or-more pole induction motor design

These long-life, babbit-lined bearings are designed to give positive lubrication. Note the removable and adjustable labyrinth-type bearing seals. These prevent oil or oil vapors from being drawn along the shaft onto the motor windings.

It's the latest Elliott step forward in motor construction to bring you improved performance and simpler maintenance. Note the modern functional design of the rectangular frame. Important structural strength for lifting also is contained in this frame construction. Other features you will like are the heavy rigid flat steel plate bearing brackets, split horizontally with the upper half easily removable for internal inspection. Ring-oiled split sleeve bearings are built to stand abuse and Kolene-processed to last. Get complete details in Bulletin PB 7000-2. Write Elliott Company, Ridgway, Pa.

Elliott FABRI-STEEL

ELLIOTT Company

RS-1

Correct Breaker Applications Hinge on 6 Considerations

Industrial installation plans should include ratings, duty, overcurrent device, service conditions, safety, economy

B. K. STURGIS, Switchgear Division, Engineering Department, I-T-E Circuit Breaker Co, Philadelphia, Pa.

In applying low-voltage air circuit breakers, adequate interrupting ability may dictate to the industrial engineer one choice of equipment, and economy another. Breakers should never be applied above interrupting rating without careful consideration of the safety of operating personnel. Future additions increasing interrupting requirements should also be considered, for it is false economy to install equipment that will be replaced in a few years.

In general, there are a number of ways in which low-voltage air circuit breakers have been misapplied. These include misapplications from the standpoint of:

1. Ratings, including interrupting, current, voltage, and frequency ratings.
2. Repetitive closing and opening duty.
3. The correct overcurrent device for a particular application.
4. Unusual service conditions.
5. Safety.
6. Economy.

These are usually avoided when a recognized engineering firm makes the installation or the aid of manufacturer's application engineers is enlisted. The following references will help:

1. "Electric Power Distribution for Industrial Plants" (Published by AIEE).
2. "Standards for Large Air Circuit Breakers" (NEMA Publication No. SG-3-1951).
3. "Standards for Power Switchgear Assemblies" (NEMA Publication No. SG-5-1950).

Valuable information is contained in the application sections of the manufacturers' catalogs.

Interrupting Ratings . . . Perhaps the most common industrial misapplication is in relation to interrupting rating, which occurs through:

1. Lack of understanding the method of determining interrupting rating of breakers.
2. Neglect of factors contributing to fault current through a particular breaker.
3. Inadequate consideration of interrupting ability of installed breakers when a system is being expanded.

Interrupting rating of a low-voltage air circuit breaker is that current, expressed in rms amperes, which the circuit can deliver to the line side of the breaker. In testing a breaker to determine its compliance with this rating, a circuit is set up to deliver rated current without the breaker in the circuit. The test is made after the breaker has been introduced. Thus actual current the breaker is required to interrupt is reduced below interrupting current by impedance of the breaker itself. For smaller current ratings, this reduction may be appreciable. Impedance of the breaker interrupting fault current should not be considered part of circuit impedance when computing fault current that a breaker will be required to interrupt.

Asymmetry Must Be Considered . . . The industrial engineer must give attention to another source of error in a specific application. He must use the factor of asymmetry of the fault current which in the low-voltage air circuit breaker standards is 1.25. Required interrupting capacity of the breaker must be computed as 1.25 times the computed symmetrical value of short circuit current where the breaker is applied.

On an industrial plant switchboard the bus has a number of load circuits, each fed through a breaker. In computing interrupting capacity required for these load breakers, it is not enough to consider the short-circuit current from the normal power source. The industrial engineer must consider the motors connected to the bus as acting momentarily as generators contributing fault current. This motor contribution is usually five to six times full load motor current on the bus. For 480 and 240-v systems, it is usual to consider the entire load as motor load. For 208Y/120-v systems the motor load is taken as half. In such systems, the motor contribution to a fault is 2.5 to 3 times full load current.

Current Ratings . . . Air circuit breakers do not have a "short-time" rating, such as the one or two-hour rating of some transformers, generators, and motors. When a breaker is to be used with a 500-kw generator with a full load current of 800 amp and a two-hour rating of 125%, the minimum normal current rating of the breaker must be 1,000 amp if the overload rating of the generator is to be used. A breaker in series with a transformer winding must have a normal current rating as large as the maximum short-time loading ever to be expected on the transformer.

Other specifications being absent, it is industrial practice to supply a circuit breaker having a normal rating of 125% of the transformer full load rating in order to utilize the transformer short-time rating up to 125%.

A breaker having a single rating may carry current higher than its continuous rating when current flows periodically for only short periods. On welding circuits the current is alternately on and off, and the average heating effect on the breaker may be readily computed as the rms value of the periodic current. This rms value is not the familiar one based on circuit frequency but a value of the periodically flowing current. As such, it is the basis upon which continuous current rating of the breaker is selected.

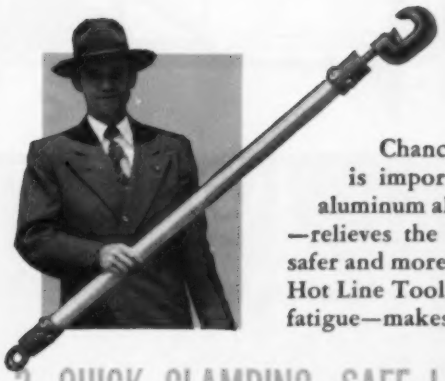
(*Continued on page* 25)

CHANCE *MAPLAC** HOT LINE TOOLS

offer these 3 Important Advantages!

1.*PLASTIC PROTECTION

The poles used on all Chance Hot Line Tools are completely sealed and protected with a super-tough, crystal-clear plastic finish that resists surface abrasion—is unaffected by oil, grease, gasoline, or salt water—that perfectly seals joints around metal fittings—that retains its toughness under widely varying temperatures—and can be readily repaired without special tools or heat if the coating should be cut by a sharp blow. This "Maplac" coating offers great moisture resistance and has electrical resistivity that exceeds the voltage withstand tests of the wood insulation.

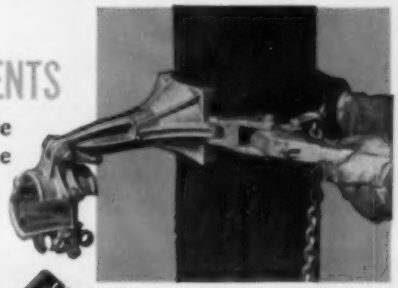


2. ALUMINUM FITTINGS

Chance Hot Line Tools are lighter in weight, where the weight is important, because the end fittings are made of heat-treated aluminum alloy. This weight reduction—with larger, stronger fittings—relieves the strain on the lineman—making hot stick work easier, safer and more efficient. Ask the men who use them! They prefer Chance Hot Line Tools because their light weight and good balance cuts down fatigue—makes them easier to use.

3. QUICK CLAMPING, SAFE LOCKING ATTACHMENTS

All Chance Hot Line Tools which require mounting on poles are equipped with this light weight chain tightener that clamps the tool quickly to the pole by a simple lever operation. A specially designed safety catch automatically and securely locks the tool support in place. The latch cannot be released unintentionally or accidentally. A half link adjustment of the chain assures a snug fit on any pole.



NEW... a manual on how to do Hot Line Work

162 pages of detailed explanations—with hundreds of drawings and diagrams that show every important operation.

Supply your line crews with this valuable aid to safety. Price is $2.50 a copy. Use the coupon at right to place your order.

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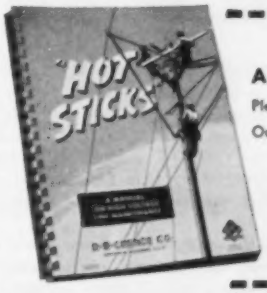

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Our check for $_____ is enclosed. Bill us for _____ copies.

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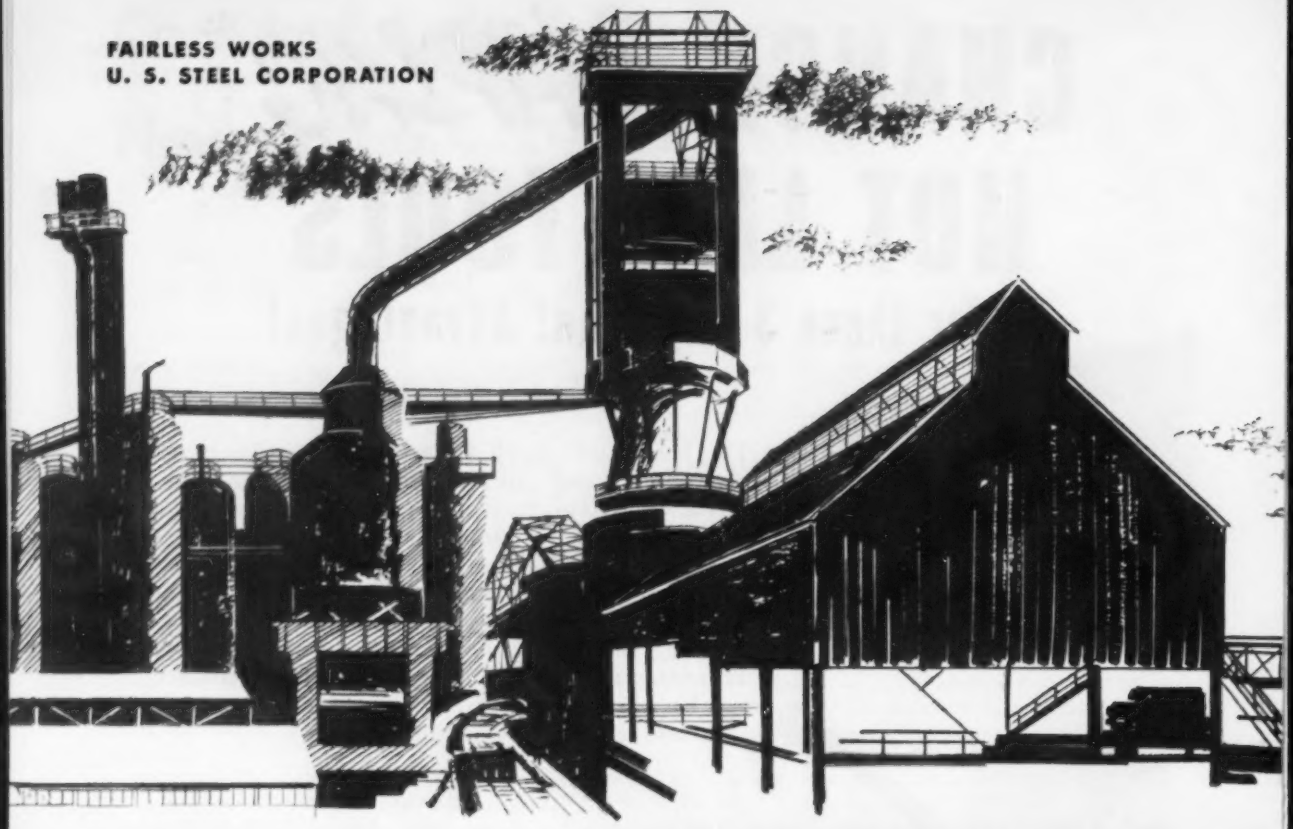
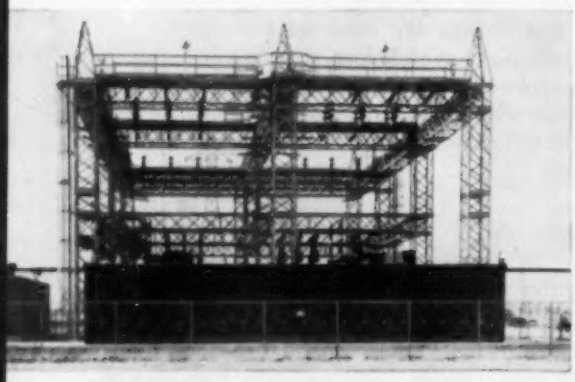
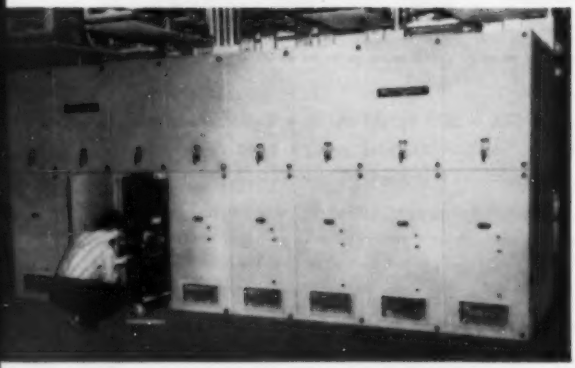
FAIRLESS WORKS
U. S. STEEL CORPORATION







(*Top Left*) This substation is typical of the five servicing the mill, pump house, power house and power company incoming line areas.

(*Bottom Left*) D-C power distribution to the hot and cold mills, the open hearth, blast furnace, and coke plant areas is handled through Westinghouse low-voltage metal-enclosed switchgear.

(*Top Right*) Duplex control switchboards are used for local control, protection and metering of primary substations. Supervisory control relays are included to provide for normal unattended operation.

Matching modern power system design and apparatus to a new, completely integrated steel mill

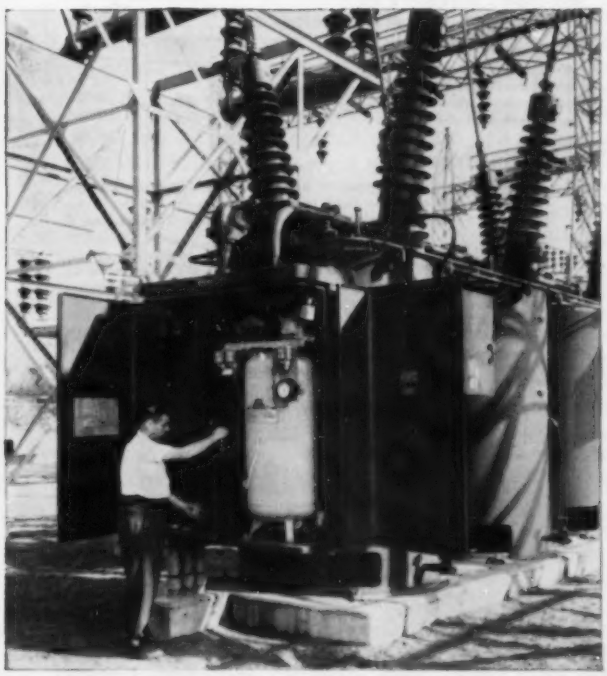
To the steel industry, Fairless Works was a "once-in-a-lifetime" opportunity: to apply—in one place—*every* technical advance in steelmaking.

The power system was no exception. With the valuable aid of Westinghouse application experience and AC Calculating Board studies, U. S. Steel engineers chose a 69-kv dual primary distribution system to all five Westinghouse-designed and manufactured substations. Secondary 13.8-kv distribution continues through Westinghouse metal-clad switchgear with Type DH, 500,000-kva air circuit breakers.

Then they matched this modern system with equally modern apparatus—much of it Westinghouse. Why Westinghouse? Because the advanced design and proved dependability of Westinghouse switchgear apparatus offered the best opportunity to provide maximum service continuity to Fairless Works—with minimum installation and maintenance expense.

Isn't there an idea here for you—if you're thinking about building a new plant or updating an old one? Just call your Westinghouse representative. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-60872

YOU CAN BE **SURE**...IF IT'S
Westinghouse



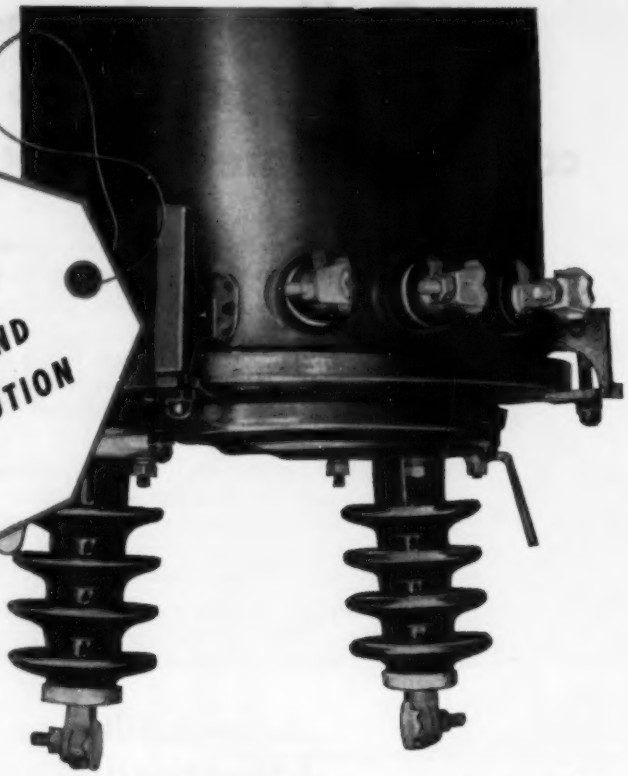
Three Westinghouse Type GM-5, 5000-mva circuit breakers are used for switching the 132-kv power company tie circuits. The 69-kv circuits employ fourteen Type GO-4B, 1500-mva circuit breakers.

This hot strip mill metal-clad assembly is typical of the indoor equipment used for the slabbing, blooming, billet and bar mills. A total of 200 Type DH, 500,000-kva metal-clad units are in service.

Westinghouse supervisory control concentrates operation of the distribution system for the entire works on a single desk. This centralized control provides for rapid and most efficient power distribution at all times.

KUHLMAN UPSIDE-DOWN TEST

INSURES AGAINST OIL AND AIR LEAKS OF DISTRIBUTION TRANSFORMERS



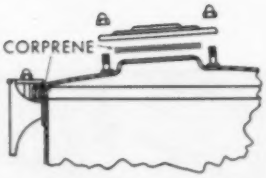
In addition to the thorough and exacting tests required by NEMA Standards*, all KUHLMAN Distribution Transformers up to 50 KVA receive a special upside down test, followed by a pressure test for air-tight, leak-free operation. First, the transformer is rotated 360° in a vertical plane to make sure there are absolutely no oil leaks, particularly in the vulnerable spots above the normal oil level line, where leaks are almost impossible to detect with the transformer in an upright position. Then a pressure test under simulated operating conditions prior to shipment provides a final check against oil and air leaks. Transformers above 50 KVA are pressure tested and checked for oil and air leaks with an electronic leak detector. KUHLMAN also spot tests all distribution transformers for impulse, audible noise, radio noise, and power factor in addition to NEMA requirements.*

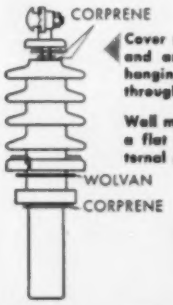
*KUHLMAN Distribution Transformers are tested as required by NEMA Standards for:

- winding resistance
- ratio
- polarity
- phase relation
- no load loss
- exciting current
- impedance
- load loss
- temperature
- applied potential and induced potential

Here is why KUHLMAN Distribution Transformers are air-tight, leak-free and moistureproof:

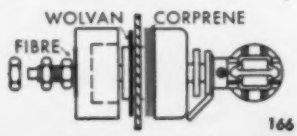
Cover and hand hole cover corprene gaskets are under constant uniform pressure insuring a permanent air-tight seal.





Cover mounted bushing gaskets have a flat seat and are held in place and protected by overhanging flanges of the bushings. Compression is through external clamps.

Wall mounted bushing gaskets are also seated on a flat surface and compressed by tightening internal nuts on bushings.



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KUHLMAN

KUHLMAN ELECTRIC COMPANY, BAY CITY, MICHIGAN • CRYSTAL SPRINGS, MISSISSIPPI • SALINAS, CALIFORNIA

Correct Breaker Application Considerations

(*Continued from page* 20)

This is not inconsistent with what has been said about one current rating when it is kept in mind that intermittent loadings may be considered only when the maximum normal current is not very high compared with rated continuous current and the period of flow is short. The industrial engineer must be careful when maximum current is four to six times continuous rating or the load interval grows to a minute or two.

Voltage and Frequency Ratings . . . Large air circuit breakers are rated today at 600 v ac, a voltage their systems hardly ever exceed. While voltage misapplications are very few, care must be taken to specify coils for auxiliary devices, such as shunt trip features, undervoltage trips, and closing relays which are designed for specific voltage.

Occasionally, frequency is neglected. In one instance a switchboard full of breakers was supplied to a plant upon specification of 60 cps in the order. After installation the supplier was advised that the 60 cps was an error and the system was actually 25 cps. This error entailed changing all potential coils. Often such errors require recalibration of the circuit breakers.

Motor Applications . . . Breakers are often used as motor controls for equipment, such as sump pumps with automatic control where contactors are the proper equipment. Circuit breaker standards specify operations up to 5,000 for switching loads up to continuous breaker ratings and much fewer for breakers closed against motor inrush current. The normal life of some contactors may be a million or more operations. With a contactor for repetitive switching, circuit protection must be provided by devices having adequate interrupting ability.

Several breakers, it was discovered at one location, were operated to close and open sump pump motor circuits more than 200,000 times in a two-year period. In a chemical processing plant, a breaker operated more than 1,200 times in about two months. These are extreme instances of a quite common misapplication. Breakers are designed to carry rated current continuously for long periods and to interrupt currents many times normal. They are not designed for repetitive operation.

Overcurrent Trip Features . . . In applying correct overcurrent trip, the particular system must be considered. The breakers illustrated can be applied in either of two ways. One arrangement provides complete selectivity and disconnects a minimum part of the system upon fault. In the alternative cascade arrangement the breakers nearest the load are applied above interrupting capacity and depend upon breakers nearer the source to back them up when interrupting fault currents. The cascade arrangement, employing breakers of lower interrupting capacity, costs less initially but has the disadvantage of possibly shutting down the system when a fault occurs in any branch. Breakers applied above interrupting capacity may be severely damaged.

In a selective trip system all breakers must have full interrupting ability because any one breaker may be required to interrupt fault current. The breaker nearest the load may have instantaneous trip for fault currents. All other breakers are equipped with devices providing direct-acting delayed tripping for fault currents. Delayed tripping in the fault current range should be distinguished from delayed tripping in the overcurrent range. The first involves times up to 30 cycles, the latter times up to several minutes. Short-time delay elements are available having three time bands. These are minimum (about 5 to 10 cycles), intermediate (about 12 to 18 cycles), and maximum (about 20 to 30 cycles).

Breaker A in the diagram would have short-time delay elements set at the maximum time band, Breaker B at the intermediate band, and Breaker C at the minimum band. Breakers in a load center fed by Breaker C would have instantaneous trip. Thus four possible steps of selectivity are provided.

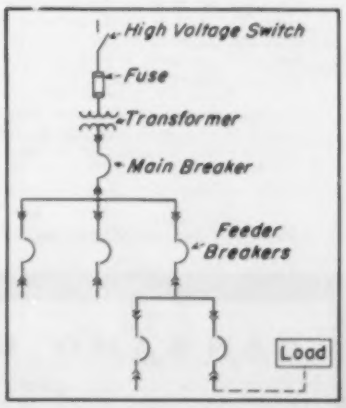
Time-delay trip features in the fault current range limit the minimum size of trip coil for a specific breaker. A breaker having 25,000 amp interrupting capacity and maximum short-time delay band has a minimum trip coil rating of 250 amp. A similar breaker with instantaneous trip has a minimum trip coil rating of 40 amp. This increase in minimum trip coil ratings must be kept in mind to avoid misapplications of short-time delay overcurrent trips. Breakers with time delay in the fault current range are electrically closed for interrupting capacities above 15,000 amp to insure that the breaker closes and latches against a fault.

Cascade System . . . Breakers in cascade must have instantaneous trip features. Breaker A would have rated interrupting capacity at least equal to that computed in the standard manner as necessary at point of application. Breaker B may have an interrupting capacity not less than half and Breaker C not less than ⅓ full computed value. The instantaneous trip on Breaker A is set at 80% of interrupting capacity of Breaker B so that it will back up Breaker B. Breaker B is set at 80% of the interrupting capacity of Breaker C to back up the latter. All breakers applied above their interrupting capacity must be electrically operated to protect operators.

All breakers in series in a cascade system may open on fault currents so that the system should not be used where continuity of service is important.

Protecting AC Motors . . . A thermally delayed overcurrent trip feature is used for breakers protecting ac motors, an application limited to motors started infrequently. This device has

(*Continued on page* 27)



BREAKER CONSIDERATIONS involve the supply transformers, buses, and the wiring system

the J2 Meter is the SLOW SPEED METER

694,450
it's as simple as – 416,666

the J2 makes fewer revolutions *and fewer revolutions mean less wear . . . longer service life!*

The J2 Watthour Meter is the *slow speed meter*. It makes fewer revolutions than other meters—including the J2's predecessor, the Sangamo Type J—to measure the same load.

Fewer revolutions mean less wear on all moving parts . . . and *less wear means longer service life.*

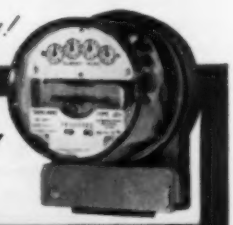
Here's what this means in terms of only one year's time. The J2 has a 6.0 constant. It makes 166⅔ revolutions to measure one kilowatthour. The J Meter had a 3.6 constant. It made 277.7 revolutions to measure one kilowatthour.

Today's average residential load is 2500 kilowatthours. If you multiply this figure by 277.7, you get 694,450—the number of revolutions a 3.6 constant meter must make in order to measure 2500 kilowatthours.

Let's multiply 2500 kilowatthours by 166⅔, the speed of the J2 Meter. Here we get 416,666 revolutions per average load per year. And the difference between 690,450 and 416,666 is 277,784. In other words, the J2 makes 277,784 *fewer* revolutions in a year to measure the *same* load.

While the total fewer revolutions the J2 makes in only a year's time is impressive, think what it would add up to by 1985! Doesn't it stand to reason that there will be less wear on the moving parts of the J2? And with less wear on moving parts, it just naturally follows that the J2 will give many more years of trouble-free service.

the FIRST watthour meter with straight line accuracy up to 100 amperes!



SANGAMO ELECTRIC COMPANY

SPRINGFIELD, ILLINOIS

JM55-2

Breaker Applications

a tripping curve laying under and similar to the motor heating curve. In applying it, there must be careful selection of correct current rating of the trip element to protect the particular motor. Manufacturers' catalogs have tables showing the trip element for a given motor full load current.

Normally, no compensation for ambient temperature changes is provided. When motor and breaker locations have wide temperature differences, the manufacturer should be consulted about compensating devices. Thermal type trip devices are not recommended for outdoor use where sun's heat may boost internal temperatures.

Thermal overcurrent features sometimes actuate an alarm instead of tripping the breaker. In such application locked-rotor protection is essential. This is usually provided by equipping two poles of the breaker with thermal overcurrent features set for overcurrent alarm and the third pole with the same kind of device to trip the breaker on locked-rotor currents.

Wrong overcurrent trips have been installed to protect a bus duct of the plug-in type. As conductor spacing in such ducts is large in proportion to the cable, reactance is relatively high. On long runs the short-circuit current is often below the instantaneous setting of breakers. Instantaneous trips on such breakers should be five to six, instead of the usual ten to twelve, times normal rating.

Unusual Service Conditions . . . Standard ratings of breakers are based on use in a clean, dry atmosphere free of injurious acids, alkalies, and gases where good ventilation is provided. Standard current ratings are based on ambient temperature not exceeding 40 C. A breaker is misapplied when operated up to full rating when completely enclosed. When it must be enclosed because of the dusty atmosphere such as a cement mill or wet atmosphere such as some meat packing plants, its full load current should be reduced below normal rating to compensate for lack of ventilation. Breakers in such locations without proper enclosures are a misapplication. Dust or moisture eventually interfere with normal operation.

Safety . . . Standards for large air circuit breakers state that manually operated units are limited to applications where interrupting requirements do not exceed 50,000 amp, tripping is instantaneous for currents above 15,000 amp for dead front and enclosed breakers, and interrupting requirements do not exceed 10,000 amp for live front breakers. These limitations are intended to protect the operator. Open type or stationary mounted breakers involve maintenance hazards that are largely eliminated in dead front drawout equipment.

Economy . . . Occasionally interrupting capacity may be sacrificed for economy where service continuity is not of prime importance and a shutdown of a few minutes is not a life-and-death matter. Calculated risk, however, must be justified.

At a cement plant installation, breakers feeding loads were applied on circuits with possible short-circuit currents greater than interrupting capacity. The plant engineer felt the risk was justified; that he would not have to deal with fault current close enough to the breakers to result in currents exceeding capacity. An operator, however, closed a wrong breaker while the switchboard was only partly in service, and the circuit shorted near the breaker terminal. Despite the necessary breaker replacement, the cost of installation remained well below what it would have been were the breakers of the next higher interrupting rating.

POWER BRIEFS FROM THE NEWS

● Pacific Gas & Electric Co has received approval from the California Public Utilities Commission to build a 50,000-kw steam plant at Buhne Point, four miles south of Eureka, Calif. The plant, designed to facilitate addition of three units, is estimated to cost $9 million.

● The slogan "Center of Industrial America" has been adopted by Ohio Edison Co to describe the 9,000-sq mile area it serves, which includes some 40 counties in central and northeastern Ohio and western Pennsylvania. The utility uses the slogan for the name of its new color film which shows the industrial might and scenic beauty of the region.

● These utilities have announced the following construction plans: American Gas & Electric System has budgeted $80.3 million for 1955 and more than $99.6 million for 1956; Utah Power & Light Co, $18 million, for 1955; Florida Power Corp and its subsidiary, Georgia Power & Light Co, $110 million through 1958; Southern Colorado Power Co, $5.1 million for 1955; Illinois Power Co, $56,789,000 million for next few years with $24.2 million for 1955; Cleveland Electric Illuminating Co, $160 million over next five years; Consolidated Gas Electric, Light & Power Co Baltimore, $35 million in 1955; Pennsylvania Electric Co, $16 million in 1955; Philadelphia Electric Co, $70 million in 1955; Los Angeles Department of Water & Power, $335 million over next five years; Pacific Gas & Electric Co, $120 million in 1955; Pacific Power & Light Co and Portland General Electric Co, $12.9 million and $10 million, respectively, for 1955; Central Power & Light Co, $23 million; Atlantic City Electric Co, $13 million; and New England Electric System, $50 million, in 1955.

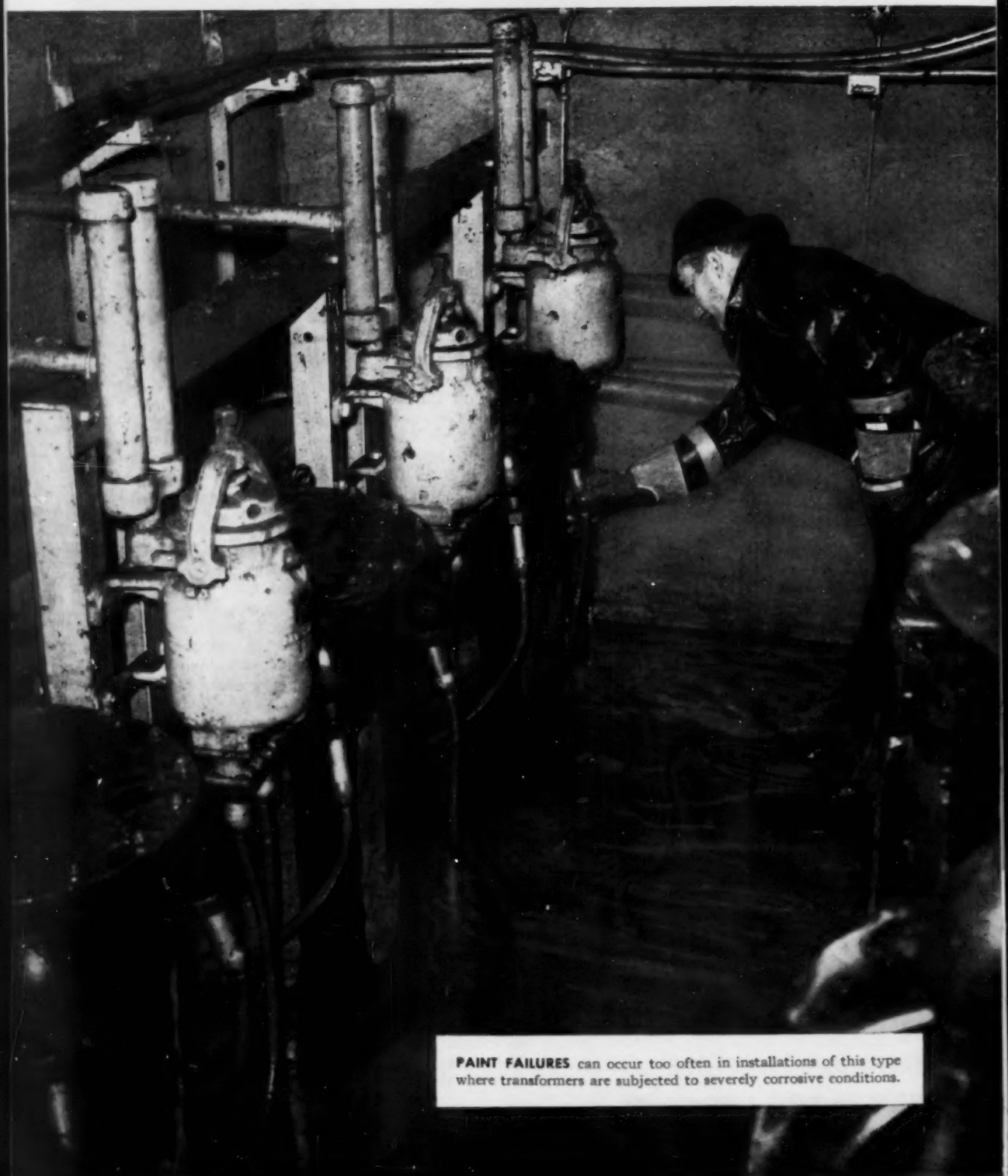
● Federal Power Commission has issued a 36-month preliminary permit to PUD No. 1 of Snohomish County, Everett, Wash., for a 125,000-kw hydro project on the Sultan River.

● Sixth generator at McNary Dam was cut into the Northwest Power Pool earlier this month. Unit has a rating of 78,000 kw.

● International Union of Operating Engineers, AFL, has contributed $6,500 toward the costs of the National Hells Canyon Association's efforts before the Federal Power Commission to thwart Idaho Power Co's hydroelectric proposals for Hells Canyon.

● British Columbia Electric Co expects to start immediate construction on a $25-million hydroelectric project at the Cheakamus River 14 miles northwest of Squamish, B. C. The utility, which just received a provincial water rights license to develop the site, plans to complete the 130,000-kw plant by 1958.

NEW G-E PAINT RETARDS



PAINT FAILURES can occur too often in installations of this type where transformers are subjected to severely corrosive conditions.

TRANSFORMER CORROSION

MELAPRENE --- a new synthetic rubber finish --- protects G-E subway transformers from water, sewage, acids, calcium chloride

General Electric Melaprene finish lasts as much as 3 times longer than conventional coatings . . . brings substantial reductions in maintenance costs

At $100 a transformer—and that's a conservative estimate—the cost of removing and repainting subway units can run into thousands of dollars a year. You can substantially cut this expenditure by installing G-E subway transformers, now protected against corrosion with a new synthetic rubber finish, Melaprene. Two coats of Melaprene are applied on top of the present G-E subway finish.

Melaprene has extra-long life because it withstands the corrosive elements which run through ventilating grills onto your subway transformers. Melaprene is highly resistant, for example, to calcium chloride (now used in many cities for melting snow on streets), sewage, acids, and seawater, especially important in locations where tides may flood your subway vaults.

Durability of Melaprene is as much as 3 times greater than other paints. Melaprene test samples are still in top-notch condition after 5000 hours exposure in an accelerated salt-spray test. The best subway transformer finish previously available stands up only 1600 hours under this test. This improvement is a direct result of developmental work in G-E laboratories.

STRETCH TEST demonstrates strength, continuity, and freedom from porosity of the Melaprene paint film. Applied in two coats on top of the standard G-E finish, this new synthetic-rubber paint gives extra protection against corrosion.

For complete information on G-E subway transformers, now protected against corrosion with Melaprene, contact your nearest General Electric district office or write Section 431-27, General Electric, Schenectady 5, New York.

Progress Is Our Most Important Product

GENERAL ELECTRIC

1. Line construction goes with home building

2. Holes are drilled, nuts tightened electrically

'Cold Crews' Speed Line Construction

BARRY H. McPHEE, District Superintendent, Southern California Edison Co, Whittier, Calif.

Mushrooming subdivisions in southern California stimulated Southern California Edison Co to experiment with "cold crews"—construction crews that work only on de-energized equipment—in building distribution lines and services on an assembly-line basis.

While experimentation and shaking down of tools and procedures continue, several facts have been established, such as:

1. The methods used by "cold crews" provide worthwhile experience for the beginning crewman.

2. The quality of the work is very high.

3. Comparative study shows that completed job costs strongly favor the "cold-crew" method for large subdivision or tract jobs.

Job Requirements . . . For the most advantageous use of a cold crew the job should be large, "cold-crew" methods should be applicable to practically all the work, and a considerable amount of pole-setting should be involved.

The "cold-crew" operation is set up on the basis of each man or sub-group in the crew doing one particular job. First, a line of post holes is dug and the poles are spotted. Then the crew goes down the line to gain the poles, frame them, and attach the hardware and transformers. A derrick truck follows the crew to set the poles.

5. Trenching for anchor with air compressor

6. Guys are tensioned

3. Transformers are attached by ground crews

4. Finished pole is raised with wires strung

from Hole Digging to Sagging In

The job is completed as ground rods are driven, anchors set, and holes backfilled and tamped. In some instances the wire is strung on the poles while they are on the ground and raised with the poles. The "cold crews" also tension the guys and sag the conductors. The assembly-line method is also applied to the construction of street lighting systems in new areas.

Tools and practices . . . Among the most important features of the "cold-crew" system is the use of certain tools and labor-saving devices and practices.

Such operations as air tamping around poles and anchors are completed with a degree of speed and quality not possible under the former manual methods. An air-driven spade is employed in installing butt blocks. These are also tamped in by air, using a special size of tamping butt.

For maximum economy, a 100-psi, 600-cu-ft air compressor mounted on a pickup truck rotates among three crews to provide power for the air-operated tools.

Portable Generators . . . A portable, 1.5-kw electric generator, used as regular equipment by standard Edison crews, is part of the cold-crew equipment.

This generator powers such electric hand tools as a wood drill, an impactor for tightening nuts, and an electric hammer. A special chuck added to the hammer allows rods to be driven with ease, even in the hardest ground.

7. Pulling crew gets go-ahead for stringing

8. Primary and secondary are sagged in

Kyger Creek Plant, Cheshire, Ohio

Clifty Creek Plant, Madison, Ind.

Major OVEC Steam Plants Deliver

Two major electric power plants, which when completed will be the largest built by private industry, are officially in operation today. Ohio Valley Electric Corp has announced that its Clifty Creek Plant, Madison, Ind., and Kyger Creek Plant, Cheshire, Ohio, are delivering energy to the U. S. Atomic Energy Commission's new uranium diffusion plant near Portsmouth, Ohio.

The first 200,000-kw turbo-generating unit at each is in service after weeks of test. Their power is going to Portsmouth via OVEC's new 330-kv transmission system, consisting of the highest voltage lines in the country. Clifty Creek Unit 1 went into operation approximately on schedule. Unit 1 at Kyger Creek was more than a month ahead of schedule. Nine more similar machines will bring OVEC's total capability to 2.2-million kw in early 1956.

"For size, scope and speed, this accomplishment has been without precedent," said Philip Sporn, OVEC president. "OVEC actually made the transition from drawing board to operation in a little more than two years—a comparatively brief interim for any major power project. We are very proud that this achievement has been brought about by private industry on time and with maximum economy. In all our work during the past 27 eventful months, we have been consistently concerned to keep costs to an absolute minimum, and we believe that we have succeeded.

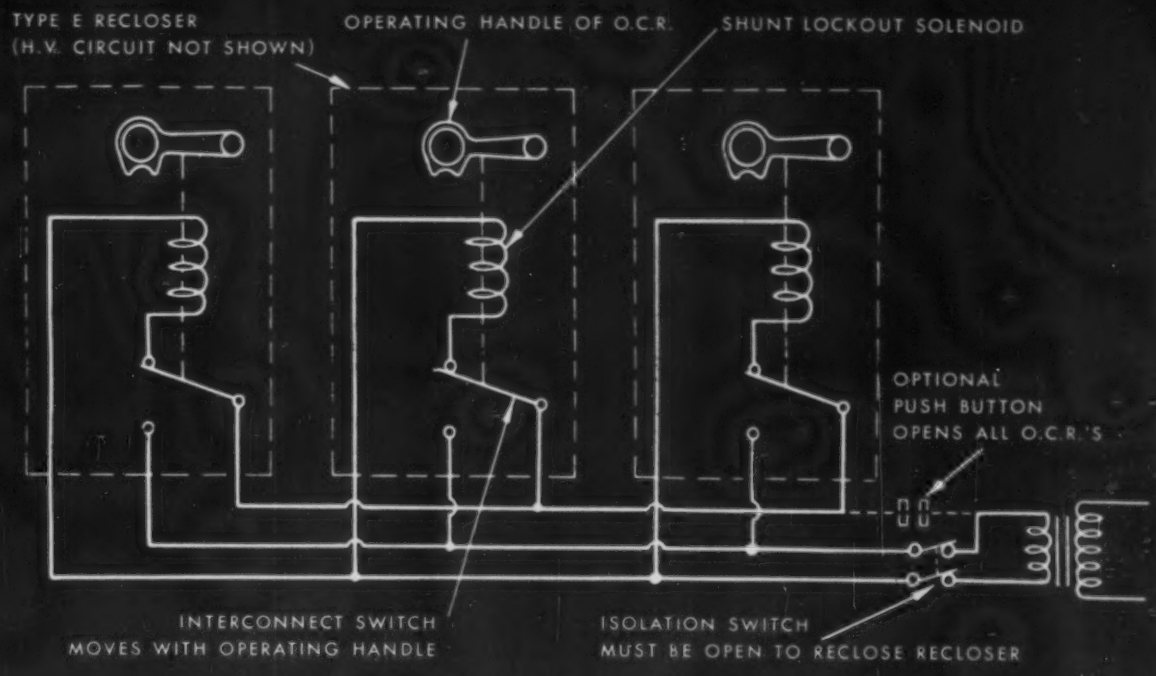
"In a sense, all of us who have had a part in sponsoring this project feel that in OVEC we have accepted a trusteeship on behalf of the federal government. We feel that it is our responsibility to make certain that the government never bears unreasonable or inequitable expenses. And, in fact, it has been our constant goal to do a better job in every respect for the AEC than anyone else could do."

OVEC was organized Oct. 1, 1952, after the AEC had called upon private utilities to provide power requirements of the then-projected Portsmouth plant. Teamed together to form it are the following 15 companies:

Appalachian Electric Power, Cincinnati Gas & Electric, Columbus & Southern Ohio Electric, Dayton Power & Light, Indiana & Michigan Electric, Kentucky Utilities, Louisville Gas & Electric, Monongahela Power, Ohio Edison, Ohio Power, Pennsylvania Power, Potomac Edison, Southern Indiana Gas & Electric, Toledo Edison, and West Penn Power.

The 25-year contract, signed Oct. 15, 1952, calls for OVEC to supply 1.8-million kw of electricity, or approximately 15-billion kwhra year.

Ground was broken at the plants, both on the Ohio River, in December, 1952. Clifty Creek, 50 miles downstream from Cincinnati, will have six 200,000-kw units, a total capability of 1.2-million kw—greater than any steam power plant now operating. It will represent an investment of about $175 million. Kyger Creek, midway between Parkersburg and Huntington, W. Va., will have five of the same units totaling 1-million kw and will cost about $145-million. All units will operate at a steam pressure of 2,000 psi and steam temperature of 1,050F, and will burn about 7½-million tons of coal a year. Their energy will be used in the large-scale separation of isotope U-235 from natural uranium.



Wiring diagram shows shunt lockout solenoids as applied to three Kyle Type E 23 kv reclosers. If any one phase locks out, the solenoids automatically lock out the other two phases.

Solenoid for Kyle® Type E Recloser Prevents Prolonged Single-Phasing

New shunt lockout solenoid is now available on Kyle Type E reclosers to prevent prolonged single-phasing of three-phase feeder. The Type E recloser coils are rated from 5 to 100 amperes at 23 kv with high interrupting capacities of 2500 amperes at 14.4 kv, 1750 amperes at 23 kv.

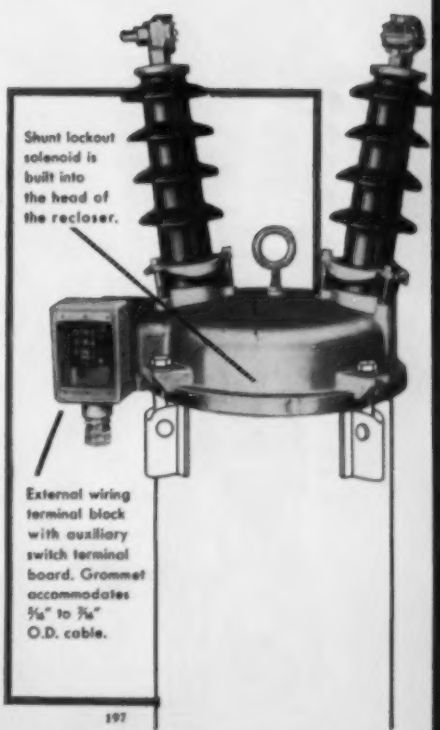
By W. C. Wiechmann
Application Engineer, Kyle Products Sales, Line Material Company

The shunt lockout solenoid, available on L-M's Kyle Type E recloser, is designed to trip the lockout latch and lock the recloser out. Electrical interconnection of the Type E recloser is made through the solenoid coils, thereby providing multi-phase lockout of the feeder. This multi-phase lockout will prevent a back-feed to a fault through the other phases —and eliminate prolonged single-phasing on three-phase equipment.

The shunt lockout solenoid is built into the head mechanism of the recloser. If any one phase locks out, the solenoid locks out the other two phases. The coil operates on 115 volt service and requires approximately 250 va per recloser. If an existing secondary is not available, a 1½ kva transformer is recommended. The device is an additional feature which is built in at the factory, on order.

The Kyle Type E is the only 23 kv recloser on the market. It has exceptionally strong construction and heavy insulation. The large contacts of finest arc-resisting material and the improved oil cross-blast method of arc extinction make the Type E an outstanding recloser for high-voltage application.

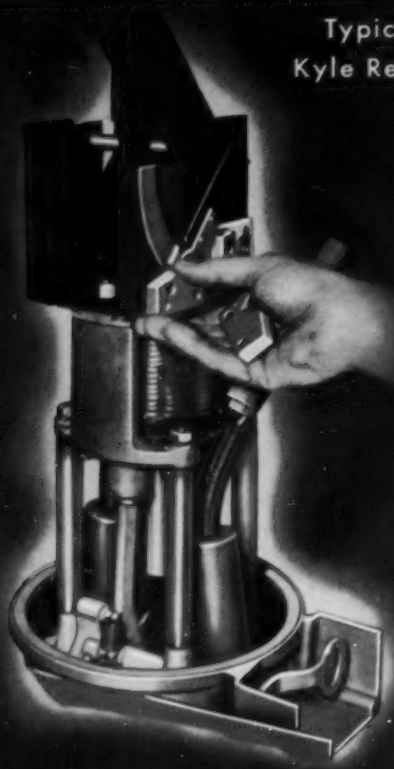
Get details on the Type E recloser and the multi-phase lockout, both of which have proved so successful in service. Ask the L-M Field Engineer for copy of bulletin on the Kyle Type E, or write Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).


Shunt lockout solenoid is built into the head of the recloser.
External wiring terminal block with auxiliary switch terminal board. Grommet accommodates 5/16" to 3/8" O.D. cable.

197

LINE MATERIAL Kyle® Reclosers

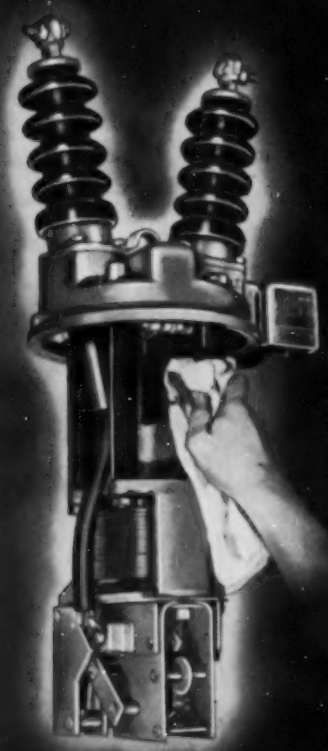
Typical Procedures for Kyle Recloser Maintenance



Check mechanism to see if contacts close freely, are smooth and free from carbon. L-M offers a complete contact assembly which is pre-adjusted at the factory and very easy to install.

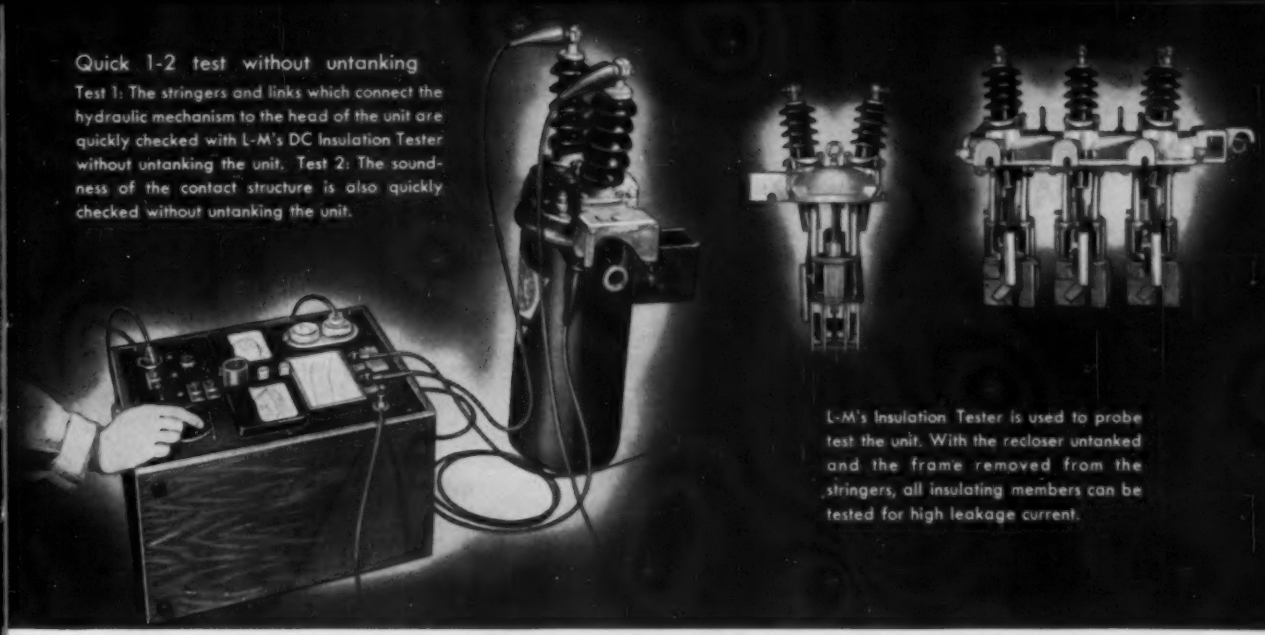
If liner shows signs of moisture such as blisters, or softness at bottom, it is an indication that the recloser may need drying out. The liner should be replaced or dried out when there are signs of moisture.

Clean tank with new oil and thoroughly wipe out carbon deposit. Refill with oil that has been hi-pot tested, whether new or reclaimed. (New oil may have absorbed moisture if the drum was left open for any length of time.)



Clean mechanism, removing all carbon traces by wiping with clean, lint-free cloth, paying special attention to all insulating parts.

Before mechanism is replaced in tank, check and install a new head gasket, if necessary, to insure a good seal against moisture.



Quick 1-2 test without untanking

Test 1: The stringers and links which connect the hydraulic mechanism to the head of the unit are quickly checked with L-M's DC Insulation Tester without untanking the unit. Test 2: The soundness of the contact structure is also quickly checked without untanking the unit.

L-M's Insulation Tester is used to probe test the unit. With the recloser untanked and the frame removed from the stringers, all insulating members can be tested for high leakage current.

Take Advantage of Longest Practical Maintenance Cycle in Kyle® Reclosers

The maintenance cycle may be one, three, or more years, depending on climatic conditions and the duty imposed on the recloser. A method is given for determining frequency and simplifying maintenance.

by **FRANK McSTAY**
Manager
Kyle Products Sales
Line Material Company

Many Kyle reclosers are still in operation after three, four, or more years without any maintenance. To assure dependable and continued operation, such reclosers should be checked. Kyle engineers recommend a program of spot checking reclosers, to determine the longest safe maintenance cycle for your operating conditions.

The length of time a recloser can be operated without maintenance depends on several factors. Collection of moisture, for example, is a result of time, loads, and climatic conditions. The collection of carbon is, of course, a result of the operating duty, i.e., the number of arc interruptions, magnitude of the current, voltage, and power factor of the fault current. These factors, involved in determining the recloser maintenance cycle, vary with each section of the country and with the operating duty imposed on the recloser. To obtain the longest practical maintenance cycle you should organize a program that meets your individual requirements.

One means of making a quick insulation check, without disassembling the recloser, is with L-M's new DC Insulation Tester. This is a highly efficient, low-priced portable unit that accurately determines the condition of insulation in reclosers and other apparatus.

If you find it necessary to replace the contacts on the recloser, it is advisable to replace the complete contact assembly, because this insures obtaining the proper setting of the contacts without calibration equipment. L-M makes available a complete contact assembly which is pre-adjusted at the factory and very easy to install. All the insulation parts as well as the contact assembly are shipped in a sealed plastic bag so that they will be protected from moisture in handling and storage.

Get The Facts On Maintenance

The L-M Field Engineer can help you with your maintenance problems. Discuss them with him—you'll find his advice helpful. Detailed maintenance instruction bulletins are available for Kyle reclosers, switches and sectionalizers. A bulletin that discusses factors determining the frequency of maintenance periods and how maintenance should be done is also available. Ask your L-M Field Engineer for these bulletins or write Kyle Products Division, Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).

Coils are vacuum-impregnated and shipped in oil-filled, sealed cans. L-M reclosers are so constructed that coils of different ampere ratings are interchangeable.

Other insulation parts as well as the contact assembly are shipped in sealed plastic bags to protect against moisture and dirt.

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LINE MATERIAL Kyle® Reclosers

Moore Named General Sales Manager

Southern California Edison Co has announced major changes in its commercial orgnization.

Harold Moore, former manager of Edison's right-of-way and land department, has been appointed general sales manager, a new position in the utility. His successor is A. W. Althouse, Metropolitan Division manager.

In other appointments, Howard Hayes, advertising manager, was made manager of the company's Redlands district. He has been succeeded by G. R. Haysel, formerly assistant advertising manager. T. L. Van Law was appointed manager of industrial and commercial sales and J. C. Meserve is the new manager of residential sales.

New General Sales Manager Moore joined Edison in 1925. He assumed the department post in 1948.

HAROLD MOORE

Althouse became affiliated with the Edison company in 1919 as a bookkeeper. After serving as an office manager, assistant merchandise manager, district manager, he was made assistant commercial manager in 1951 and division manager in 1952. Hayes served with a number of newspapers in the South prior to joining Edison's advertising department in 1928. He was made advertising manager in 1942.

Since joining the Edison company in 1947, Haysel has been in the advertising department, becoming assistant advertising manager in 1950. Van Law, with Edison since 1927, was manager of industrial sales before assuming the post of assistant sales manager in 1950.

Identified with Edison since 1928, Meserve was appointed in 1953 as manager of the utility's Huntington Park district.

Fredericks Made a Commercial VP

Election of Pierce G. Fredericks as a commercial vice president has been disclosed by Federal Pacific Electric Co, Newark, N. J. Fredericks, who has been closely associated with the company for the past 15 years as a sales representative, will continue to maintain offices in New York.

Before establishing his own sales agency, Fredericks was engaged in power plant engineering and construction work for Associated Gas & Electric Co, now Gilbert Associates, Inc, and Public Service of New Jersey Production Co.

Following his graduation from Cornell University in 1912, where he earned an engineering degree, Fredericks joined J. G. White Engineering Co and later the Foundation Co.

P. G. FREDERICKS

G. P. BAKKEN

Bakken Is Chase Brass' Executive VP

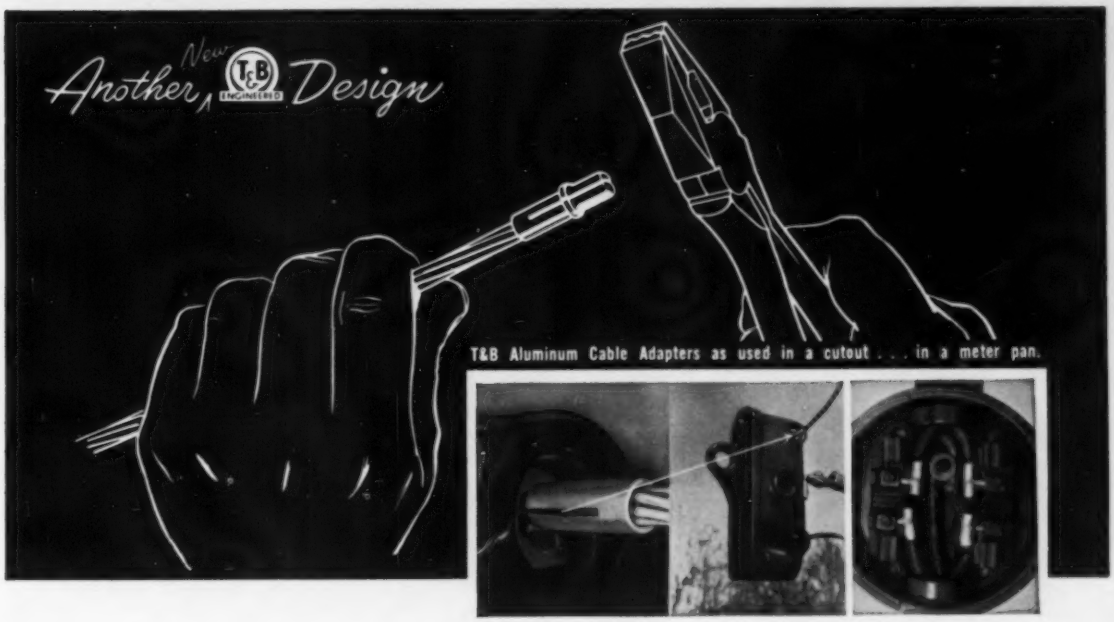
Glenn P. Bakken has been elected executive vice president and a director of Chase Brass & Copper Co, Inc. He succeeds Wallace C. Husted, who retired last September. Bakken formerly was associated with Reynolds Metals Co and was manager of that company's Phoenix, Ariz., plant.

A native of Minneapolis, Minn., Bakken was graduated from the University of Minnesota in 1942 with a B.S. degree in mechanical engineering. Upon graduation, he accepted a position with the Aluminum Co of America in Lafayette, Ind., going to Reynolds Metals in 1946.

IF YOU'RE WIRING WITH ALUMINUM . . .

Utility Engineers are now installing aluminum cable in many places where only copper had been suitable. Equipment such as transformers, capacitors, cutouts, switches, and meter pans, having terminals designed for copper conductors, are now being wired to aluminum and A.C.S.R. with little or no difficulty.

How? T&B's new Aluminum Cable Adapters. They're made of heavily-tinned copper alloy; take up little more space than the cable; install in a jiffy. A lineman or electrician merely taps one onto the end of the conductor, then clamps the adapter as though it were copper conductor. "Straight" and "flag" types are available. The flag type is best for connections at right angles to cable outlets.



One of the outstanding features of these new adapters is the serrated bore. As the adapter is tapped onto the cable, the serrations bite through the aluminum oxide coating. The high-conductivity connection thus formed is maintained, despite weather and moisture, by an oxide inhibitor precoated in the bore. The clamp end is slotted and spring-like to maintain pressure during thermal expansion and contraction.

These versatile Cable Adapters are opening up many new applications for aluminum cable. Sizes for cable up to #2 Str. at present. If you're wiring with aluminum, you might possibly have a unique application. If so, let us know about it. We'll be glad to send you a free sample of the adapter and descriptive literature. Write to The Thomas & Betts Co. today.

Note how the bore serrations have scraped through the oxide coating on the cable end.

LOOK FOR THIS SIGN — T&B AUTHORIZED DISTRIBUTION ENGINEERED

IT'S THE MARK OF AN AUTHORIZED T & B DISTRIBUTOR

The complete line of T & B fittings for conductors and raceways is sold only by recognized electrical wholesalers. It's our way of assuring you the service and savings of a friendly local source. Call him for all your electrical needs. T-415

THE THOMAS & BETTS CO.

INCORPORATED

14 Butler Street • Elizabeth 1, New Jersey
Thomas & Betts Ltd., Montreal, P.Q., Canada

MANUFACTURERS OF FINE ELECTRICAL FITTINGS SINCE 1898

What is extra-high voltage transmission?

What is extra-high voltage transmission? It's a little bit like asking how fast man can fly — the limit is constantly being raised!

Whatever its level may be, extra-high voltage transmission has always been a region of continuing research and investigation for Ohio Brass Company. Close league with the men and organizations who continually force transmission levels higher has enriched the entire O-B staff with an understanding of present-day insulation requirements that is unmatched in the insulator field.

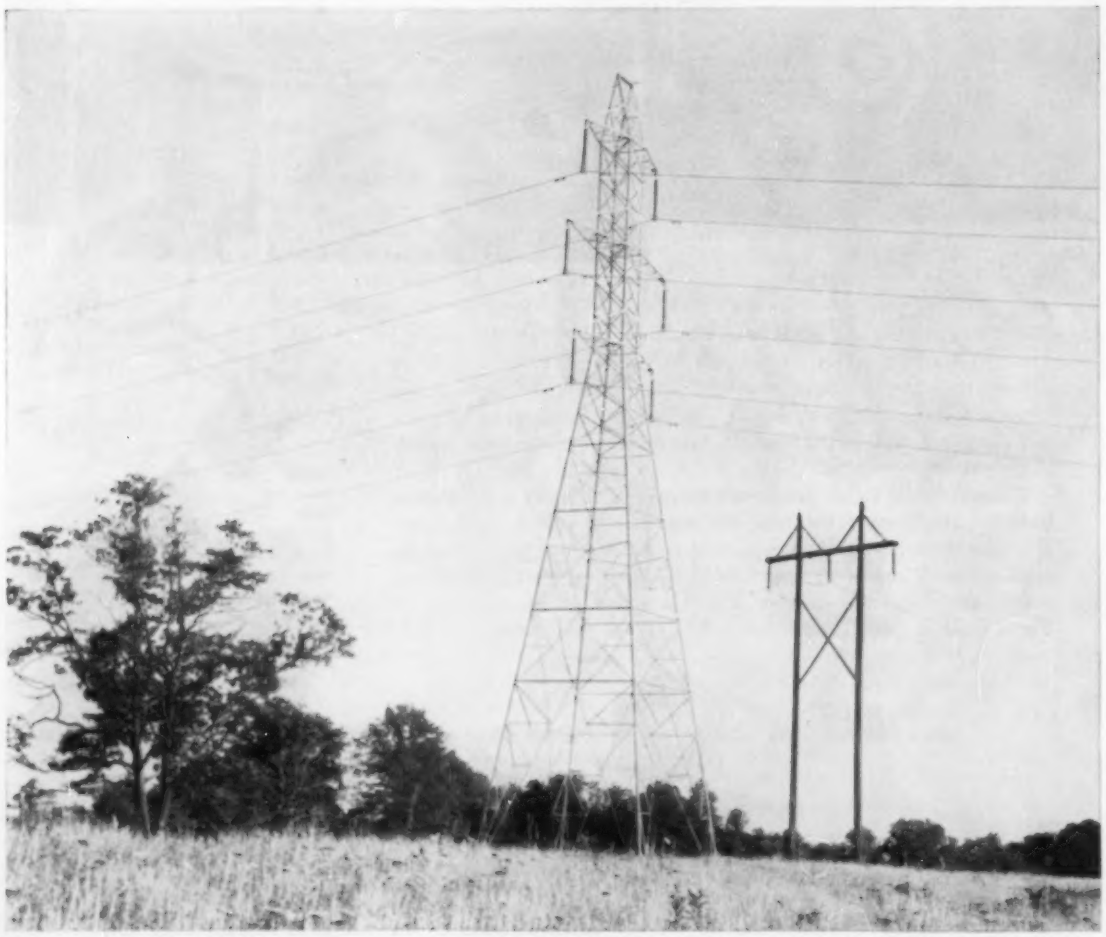
Because of that understanding, Ohio Brass is able to design and produce insulation of the highest character. And it is significant that Ohio Brass insulation has been selected for use in every extra-high voltage project now operating or under construction in the Americas.

Ohio Brass Company • Mansfield, Ohio

Steel tower of the OVEC 330-kv line provides an example of present "extra-high voltage" construction. Wood H-frame for 138-kv makes sharp contrast in size of tangent structures.

Ohio Brass

4543-H



McMorris Elevated

W. A. McMorris, formerly an engineer in General Electric Co's lightning arrester department, has been appointed manager of distribution transformer advance and development engineering. McMorris (left) is shown exchanging some engineering know-how with E. D. Treanor, who has retired as consulting engineer for the distribution transformer department. A veteran of 46 years with GE, Treanor is an nationally known engineer and pioneer in development of small, light, and efficient distribution transformers.

C. T. SINCLAIR

Carroll Sinclair Joins Loftus Corp

Carroll T. Sinclair, formerly vice president of engineering and construction for Duquesne Light Co, has been elected a vice president of Peter F. Loftus Corp. Sinclair, whose appointment becomes effective Feb. 1, will direct the design and consulting engineering activities of the firm's Utility Division.

Sinclair, an electrical engineer, started with Duquesne in 1925, serving as chief engineer prior to becoming a vice president in 1953.

Active in committee work of American Institute of Electrical Engineers, Edison Electric Institute, and American Standards Association, Sinclair was chairman of AIEE's Pittsburgh section and a national vice president. In addition, he was editor-in-chief of the Underground Systems Reference Book, the standard guide book in its field.

PERSONALS

Central Hudson G&E's **Evan C. Kovacic** has been assigned to the nuclear engineering department of Brookhaven (N. Y.) National Laboratory to study atomic power production. Assignment of Kovacic, a chemical engineer, will aid Central Hudson in increasing its knowledge of electric power production in nuclear energy field . . . Election of **George Y. Wheeler, II,** as a staff vice president with offices in Washington, D. C., has been revealed by Radio Corp of America. He formerly served with National Broadcasting Co there . . . Allis-Chalmers Manufacturing Co's General Machinery Division has appointed **Frank T. Gifford,** engineer in charge of circuit breaker design since last June, to the post of assistant chief engineer of the switchgear department at the Boston Works.

Dean Barline, public utilities director at Tacoma, Wash., has appointed two aides: **Robert Garen,** property manager, was made administrative assistant while **Bill Dugovich,** recently with U. S. Department of State, became public information officer . . . **Weaver E. Falberg,** assistant general manager of sales for all plants of Joseph T. Ryerson & Son, Inc, was made general manager of sales. Falberg's former post was taken over by **John A. Houston,** assistant sales manager of the Chicago plant . . . General Electric Co's Distribution Assemblies Department at Plainville, Conn., has announced these changes: **Robert G. Page,** a GE employee since 1948, was named manufacturing engineering specialist and **George B. Bowers,** who joined the firm in 1953, was made employee and plant community relations specialist . In addition, **Ralph C. Nash** has retired from GE's Lamp Division after 43 years' service. He was assistant manager of Continental sales district, working out of Philadelphia.

OBITUARY

Hubert C. Blackwell, 77, former president and chairman of the board of Cincinnati Gas & Electric Co, died Jan. 18 at Cincinnati.

Robert Hood Saunders, 51, chairman of the Ontario Hydro-Electric Power Commission and a key figure in Canada's efforts to develop the St. Lawrence River power resources, died Jan. 16 of injuries suffered in a plane crash.

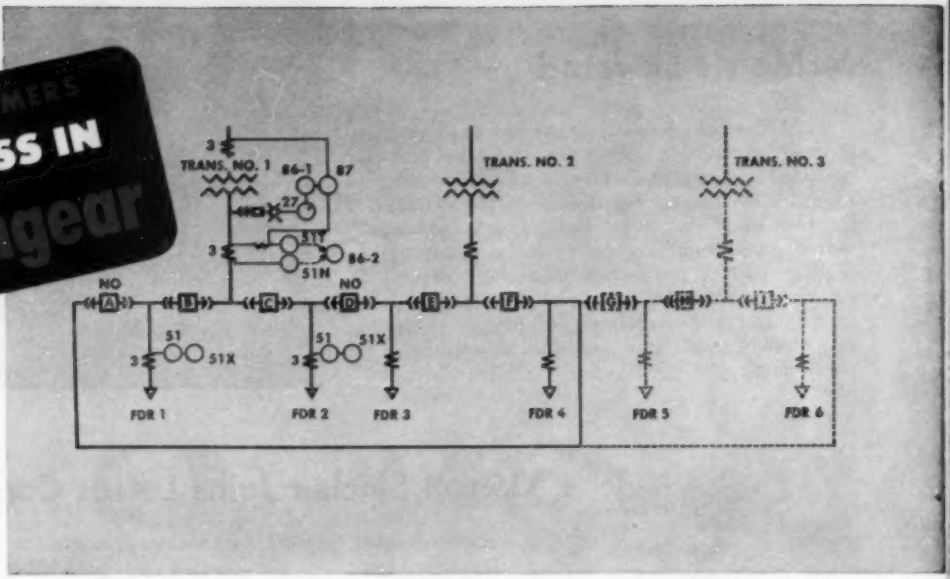
Ernest W. Davis, 64, director of engineering since 1950 and former chief engineer of Simplex Wire & Cable Co, Cambridge, Mass., died Jan. 11.

Paul L. Bartow, 52, chief mechanical engineer of Florida Power Corp, died Jan. 14 in St. Petersburg, Fla. He served the utility 30 years.

Carl L. Gerhardt, 63, chief electrical engineer for Tulsa (Okla.) district of Army Corps of Engineers, died recently.

ALLIS-CHALMERS

PROGRESS IN Switchgear



RING BUS...

Here are Questions and Answers on why

Q. *What is a Ring Bus?*

A. It is a circuit arrangement for improving power continuity by providing every feeder with two sources, using only one breaker per circuit.

Q. *Is this a new idea?*

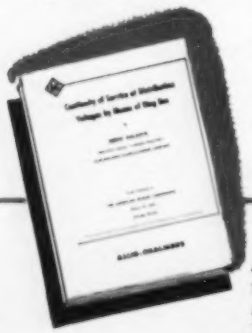
A. No. It is among the first schemes studied by substation engineers, but in its early conception it had certain drawbacks.

Q. *What were the problems of early Ring Bus schemes?*

A. Problems were mainly in physical arrangement, large space requirements, and need for tie cables and connecting bus runs.

Q. *Have these problems been eliminated?*

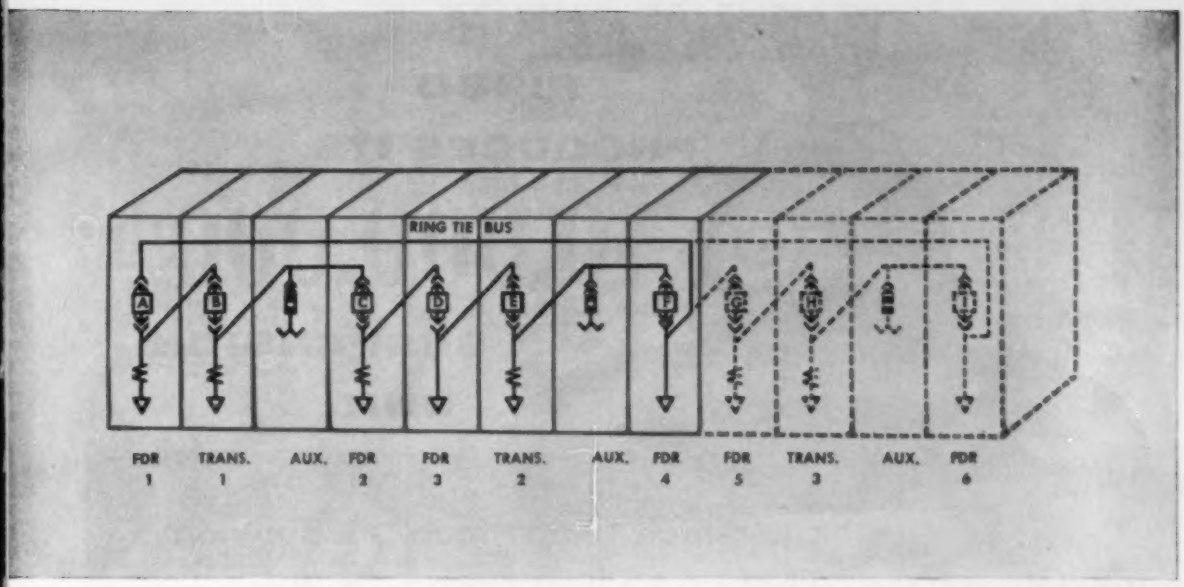
A. Yes, Allis-Chalmers pioneered a metal-clad switchgear design that permits the entire ring to be included in a lineup of standard metal-clad switchgear cubicles, thus conserving space and eliminating tie cables and connecting bus runs.



Get More Information

Ask for the brief but interesting engineering paper, "Continuity of Service at Distribution Voltages by Means of Ring Bus." Call your nearby Allis-Chalmers office, or write Allis-Chalmers, Milwaukee 1, Wisconsin.

ALLIS-



Advantages

interest is turning again to the Ring Bus

Q. *What are main advantages of Ring Bus?*

A. There are several in addition to those mentioned.

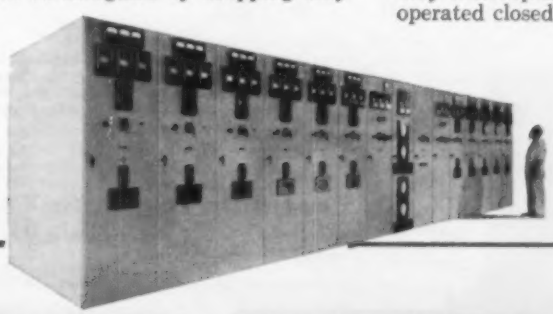
1. Adds power continuity — Any breaker can be removed from its unit without disrupting continuity of service.

2. Aids maintenance — Any portion of switchgear bus can be de-energized by dropping only one circuit.

3. Adds flexibility to station — Substation capacity may be increased by adding transformer and feeders at either end by dropping only one circuit.

4. Ring Bus is versatile — Each set of feeders and its supply transformer can be operated separately when ring tie breakers are open. When momentary interruptions are undesirable, ring may be operated closed and transformers paralleled.

A-4421



CHALMERS

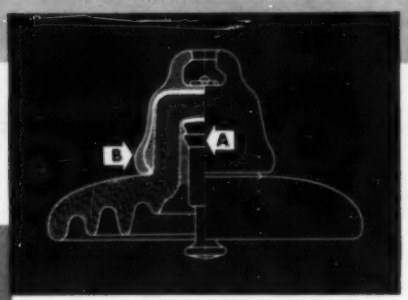
A-C ALLIS-CHALMERS

PINCO PRODUCES ITS 10,000,000th SUSPENSION UNIT

Since 1921, Pinco Suspension Insulators have rolled up an impressive record of 50,000,000 SERVICE YEARS without replacement due to electrical or mechanical failure.

Just recently, the 10,000,000th Pinco Suspension Insulator came off the production line. And because, from the first, the basic design has been *exactly right*, the famous Pinco Corset Cap and the Two-Step Pin today are accepted everywhere. And Pinco has kept ahead of industry needs with heavier, more rugged porcelain bodies, designed and built to meet future line requirements.

Yes, Pinco design has proved its perfection under the toughest laboratory tests and under every condition of actual service. So for "right-on-the-job" performance, lower maintenance costs, longer line-life . . . *put up Pinco* TO BE SURE!



The Pinco 1060 Insulator conforms to EEI-NEMA Standards 52-3

Because they have been proved "right-for-the-job," The Pinco Two-Step Pin (A) and the Pinco Corset Cap (B) of identical design are used in all Pinco Suspension Insulators, from the 1510 (rated at 10,000 lbs.) to the 1500 (rated at 25,000 lbs.) . . . proving again that Pinco is right from the start!

For complete mechanical and electrical specifications covering Pinco Suspension Insulators, refer to Pinco Catalog No. 49, Pages 62-73, or contact The Joslyn Mfg. & Supply Co. office in your locality.

PINCO INSULATORS

1920 35 1955 YEARS OF SERVICE TO THE ELECTRICAL INDUSTRY

The Porcelain Insulator Corporation

LIMA, N. Y.

Suspension Insulators . . . Clamps and Fittings . . .
Switch and Bus Insulators . . .
Distribution and High Voltage Pin Types . . .
Guy and Tree Insulators . . . Special Porcelain.

MEETING CALENDAR

A complete list of coming meetings appears in the last issue of each month.

Week of Jan. 30-Feb. 5

EDISON ELECTRIC INSTITUTE
Power and Heating Committee, Atlanta Biltmore Hotel, Atlanta, Ga., Jan. 31-Feb. 1; Prime Movers Committee, Grand Hotel, Mobile, Ala., Jan. 31-Feb. 1; Home Service Committee, Washington, D. C., Feb. 4-5.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS
Winter General Meeting, Hotel Statler, New York, Jan. 31-Feb. 4.

AMERICAN SOCIETY FOR TESTING MATERIALS
Annual Committee Week, Netherland Plaza Hotel, Cincinnati, Ohio, Jan. 31-Feb. 4.

INTER-INDUSTRY FARM ELECTRIC UTILIZATION COUNCIL
Farm Power Use Workshop Conference, Sheraton Hotel, St. Louis, Feb. 3-4.

MISSOURI VALLEY ELECTRIC ASSOCIATION
Industrial and Commercial Sales Conference, President Hotel, Kansas City, Mo., Feb. 3-4.

Week of Feb. 6-12

EDISON ELECTRIC INSTITUTE
Accident Prevention Committee, Shoreham Hotel, Washington, D. C., Feb. 9-10; Transmission and Distribution Committee, Shoreham Hotel, Washington, D. C., Feb. 10-11.

PENNSYLVANIA ELECTRIC ASSOCIATION
Winter Meeting, Transmission and Distribution Committee, Hotel Roosevelt, Pittsburgh, Feb. 10-11.

INSTITUTE OF RADIO ENGINEERS
7th Annual Southwestern Conference and Electronics Show, Baker Hotel, Dallas, Tex., Feb. 10-12.

Week of Feb. 13-19

NATIONAL ASSOCIATION OF PURCHASING AGENTS
24th Annual Mid-Winter Conference, Public Utility Buyers' Group, Shamrock Hotel, Houston, Tex., Feb. 13-15.

EDISON ELECTRIC INSTITUTE
Industrial Relations Committee in conjunction with AGA at AMA Mid-Winter Personnel Conference, Palmer House, Chicago, Feb. 14; Electrical Equipment Committee, Deshler Hilton Hotel, Columbus, Ohio, Feb. 14-15; Commercial Electric Space Heating and Air Conditioning Committee, St. Louis, Feb. 17-18; Residential Promotion Committee, New York, Feb. 17-18; Accounting Conference, Planning, Edgewater Beach Hotel, Chicago, Feb. 17-18.

PENNSYLVANIA ELECTRIC ASSOCIATION
Winter Meeting, Prime Movers Committee, Roosevelt Hotel, Pittsburgh, Feb. 14-15; Winter Meeting, Relay Committee, Hotel Roosevelt, Pittsburgh, Feb. 15-16; Winter Meeting, Electrical Equipment Committee, Benjamin Franklin Hotel, Philadelphia, Feb. 17-18.

NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION
Annual Meeting, Convention Hall, Atlantic City, N. J., Feb. 14-17.

Week of Feb. 20-26

PACIFIC COAST ELECTRICAL ASSOCIATION
Conference on Electronic Integrated Data Processing, Hotel Statler, Los Angeles, Feb. 23-24.

NATIONAL ADEQUATE WIRING BUREAU
11th Annual Conference, La Salle Hotel, Chicago, Feb. 24-25.

***PENNSYLVANIA ELECTRIC ASSOCIATION**
Systems Operation Committee, Abraham Lincoln Hotel, Reading, Pa., Feb. 24-25.

*Week of Feb. 27-March 5

SOUTHERN SAFETY CONFERENCE-EXPOSITION
Jung Hotel, New Orleans, La., Feb. 27-March 1.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS
1st International Congress on Air Pollution, Hotel Statler, New York, March 1-2.

EDISON ELECTRIC INSTITUTE
1st Street Tree and Utility Conference, co-sponsored with EEI Transmission and Distribution Committee, Street Lighting Committee of Illuminating Engineering Society and National Shade Tree Conference, Wade Park Manor, Cleveland, March 3-4.

*Week of March 6-12

NORTH CENTRAL ELECTRICAL LEAGUE
18th Annual Upper Midwest Electrical Industry Convention, Radisson Hotel, Minneapolis, Minn., March 6-9.

PACIFIC COAST ELECTRICAL ASSOCIATION
Engineering and Operating Section Conference, Hotel Huntington, Pasadena, Calif., March 7-8.

CANADIAN ELECTRICAL ASSOCIATION
Western Zone, All Divisions, Bessborough Hotel, Saskatoon, Sask., March 7-9.

NATIONAL ASSOCIATION OF CORROSION ENGINEERS
Annual Convention, Palmer House, Chicago, March 7-11.

*Week of March 13-19

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
Edgewater Beach Hotel, Chicago, March 13-18.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS
Utilization of Aluminum Conference, William Penn Hotel, Pittsburgh, March 15-17.

EDISON ELECTRIC INSTITUTE
Industrial Relations Committee, EEI Headquarters, New York, March 17.

*Week of March 20-26

SOUTHEASTERN ELECTRIC EXCHANGE
Annual Meeting, Boca Raton Hotel and Club, Boca Raton, Fla., March 21-23.

ROCKY MOUNTAIN ELECTRICAL LEAGUE
Electric Meter Institute, University of Denver, Denver, Colo., March 21-25.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS
Management Conference, Hotel Statler, Cleveland, Ohio, March 23-24.

MISSOURI VALLEY ELECTRIC ASSOCIATION
Engineering Conference, President Hotel, Kansas City, Mo., March 23-25.

OKLAHOMA UTILITIES ASSOCIATION
Annual Convention, Mayo Hotel, Tulsa, Okla., March 24-25.

CONTROLLERS INSTITUTE OF AMERICA
Southern Conference; Mayo Hotel, Tulsa, Okla., March 25-26.

*Week of March 27-April 2

EDISON ELECTRIC INSTITUTE
Sales Conference, Edgewater Beach Hotel, Chicago, March 28-31.

AMERICAN POWER CONFERENCE
17th Annual Meeting, Sherman Hotel, Chicago, March 30-31, April 1.

ILLUMINATING ENGINEERING SOCIETY
Southern Regional Conference, Ft. Harrison Hotel, Clearwater, Fla., March 31-April 1.

*Week of April 3-9

ILLUMINATING ENGINEERING SOCIETY
Southwestern Regional Conference, Gunter Hotel, San Antonio, Tex., April 3-5.

PACIFIC COAST ELECTRICAL ASSOCIATION
Joint Conference with Pacific Coast Gas Association, Administrative Services and Accounting Section, Jokane Inn, Phoenix, Ariz., April 7-8.

SOUTHEASTERN ELECTRIC EXCHANGE
Engineering and Operation Section, Roosevelt Hotel, New Orleans, La., April 7-8.

*Week of April 10-16

NORTHWEST ELECTRIC LIGHT & POWER ASSOCIATION
Engineering and Operation Section with Personnel and Safety Section, Davenport Hotel, Spokane, Wash., April 13-15.

AMERICAN INSTITUTE OF ELECTRIC ENGINEERS
Southern District Meeting, St. Petersburg, Fla., April 13-15.

ILLUMINATING ENGINEERING SOCIETY
Southern Pacific Coast Regional Conference, Statler Hotel, Los Angeles, April 14-15.

*Week of April 17-23

AMERICAN SOCIETY OF MECHANICAL ENGINEERS
Spring Meeting, Lord Baltimore and Southern Hotels, Baltimore, Md., April 18-21.

NORTHWEST PUBLIC POWER ASSOCIATION
Annual Meeting, Eugene Hotel, Eugene, Ore., April 20-22.

*Week of April 24-30

AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS
8th Annual Conference for Protective Relay Engineers, Sponsored by Department of Electrical Engineering, College Station, Tex., April 25-27.

*Additions this week.

SIGNING Columbia Interstate Compact are (l to r, seated) Charles H. Heltzel for Oregon, Jack V. Rogers for Washington, Lloyd I. Wallace for Montana, R. P. Parry for Idaho, (standing) Hugh A. Shamberger for Nevada, F. A. Banks for the U. S., and L. C. Bishop for Wyoming.

Columbia Compact Is Signed

Agreement now must be approved by four state legislatures and Congress to become effective

Columbia Interstate Compact proposal for planning the "orderly integrated and comprehensive development" of the river basin resources has achieved formal status of accord in the Pacific Northwest. Negotiators for the U. S. and seven states signed the document Jan. 15 in Portland, Ore., and sent it along to state legislatures and Congress for consent enactment.

Delegations endorsed final draft revisions, including rewording of the vital power allocation formula. Four years of negotiations preceded the signing of the compact.

Signing were compact commission chairmen for Washington, Oregon, Montana, Idaho, Nevada, Wyoming, and a representative of the federal government. Utah's commission chairman, George D. Clyde, was delayed en route to the meeting but notified the commission that he would sign the draft later.

Commission's Powers . . . The compact, effective upon adoption by Congress and the four principal states, would establish an interstate commission with broad recommendatory powers on any major project proposed for the Columbia and tributaries in the U. S., to prepare and submit plans for development of water resources, and to resolve conflicts between the states, particularly water rights and power allocation.

Rights of the arid upper basin areas to water are insured by provision that beneficial consumptive uses hold priority over downstream nonconsumptive use at least until 2,000 A. D., at which time the commission may review priorities and, if unanimous, extend them for another 50 years. Negotiators noted all water depletion studies indicate that were all consumptive uses now foreseen to actually occur, the average annual flow of the main stream at Bonneville Dam in the period of the lowest flow of record would be reduced about 7.3%.

Change in the power allocation formula revolved around reservation of power. A draft of November would have required the commission to make a recommendation on a project to be authorized by the federal government but the commission could find such a reservation impracticable on a project built under government license by a private builder. Under pressure principally from Oregon, which has indicated fears it may lose firmed up energy at downstream plants to upstream states, this has been revised. It now provides that the commission shall make a reservation recommendation for projects to be reviewed under the compact unless the commission finds the making of a reservation to be impracticable.

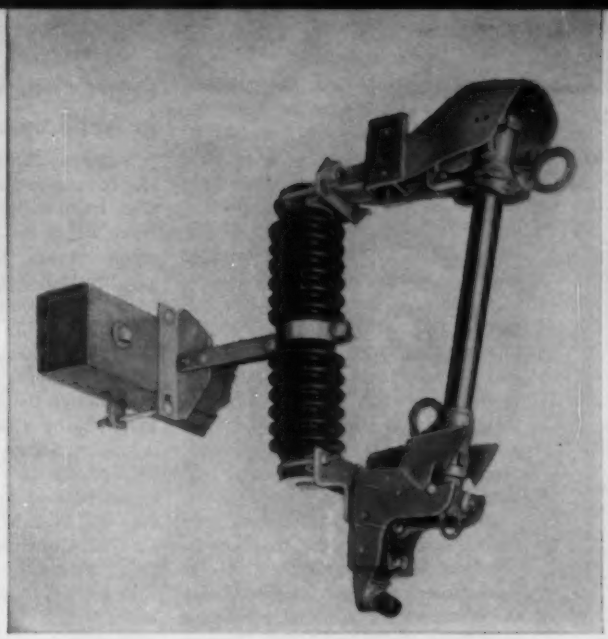
The formula incorporated in earlier drafts is otherwise intact. This assumes the basin is one region and there should be "a fair and equitable apportionment and allocation among the member states of the hydroelectric power developed." In implementing this goal, the compact provides for reservation of the prime power and energy from at site generation on the assumption of isolated operation to the state in which the project is located. In addition, the state is to receive "a fair and equitable" share of energy produced at downstream plants by reason of the coordinated operation of the projects.

Public vs Private Power . . . Overtones of the public-vs-private power battles shaping up in several of the recently convened states legislatures broke into the open when Oregon's State Sen Robert D. Holmes, Clatsop County Democrat, refused to sign the compact. Holmes, alone in his dissent and the only Democrat on the Oregon delegation, charged the organizational effort had followed "the private power line" to the exclusion of public power agency viewpoint and the commission was "loaded with Republicans, tainted with politics from the start and not truly representative."

From its inception, Holmes later told an Electrical World correspondent, the commission "seemed to be, on the part of the governors, a group to 'at all costs' stop a federal regional authority, such as CVA," and had "got its chief advice from private power company approach to the exclusion of what I consider a fair consideration of public power aspects." Holmes asserted: "I feel this divides the states, one against the other, rather than pull them together." From the viewpoint of an Oregonian, Holmes declared: "If you look at it on a purely states-rights basis Oregon is giving away something tangible: Allocation of power and allocation of water."

Criticism by Holmes promptly

"Does your distribution system have growing pains?"



NEW POWER FUSE

for Crossarm Mounting

is especially designed for use on distribution feeders where faults exceed the safe interrupting capacity of cutouts

The available short-circuit current at many of today's distribution transformers and distribution feeder sectionalizing points has ruled out cutouts as safe and reliable protective devices. At these current levels only the power fuse can assure positive, smooth circuit interruption. Only the power fuse blows without objectionable and hazardous expulsion by-products. Here is a power fuse to fit installation requirements—S&C's Type HSO on a single insulator.

The Type HSO Fuse is, of course, also available on NEMA insulators in single-, two-, and three-shot styles. In these styles the HSO has had a long and successful history in protecting power transformers and distribution feeders.

Complete information on S&C Type HSO Power Fuses and their applications is contained in Catalog Section 250 . . . we will gladly send you a copy.

S&C ELECTRIC COMPANY

4435 RAVENSWOOD AVENUE
CHICAGO 40, ILLINOIS, U. S. A.

IN CANADA
S&C ELECTRIC CANADA, LTD.
8 Vanico Road, Toronto 14, Ontario

POWER FUSES • DISTRIBUTION CUTOUTS AND FUSE LINKS • LOAD INTERRUPTERS • METALCLAD SWITCHGEAR

Specialists in High-Voltage Circuit Interruption

sparked a rebuttal from the Montana delegation, spearheaded by James E. Murphy, Kalispell, and from R. P. Parry, chairman of Idaho delegation.

Said Murphy: "I resent Mr Holmes implication that I'm a handmaiden of private power groups. This is the first time politics has ever been injected into our discussions." After noting Holmes was absent from many meetings, Murphy directed his comments to the entire Oregon delegation. He said the water and power clauses, as originally drafted, had been "something to which we could point with pride" but after Oregon forced amendment "they cut off the hand that had been pointing with pride."

Parry, an attorney for Idaho Power Co, answered charges that the commission was biased in favor of private power companies' viewpoint by noting the commission's principal consultant in drafting the compact was Howard E. Stinson, Idaho Falls attorney and former Bureau of Reclamation counsel who also has drafted a bill for a federal high dam in Hells Canyon. The Idaho company aide said Stinson's reputation as a proponent of public power during 16 years with the bureau was well established but did not preclude use of his expert advice in formulating the compact.

Stinson also entered the discussion commenting: "I do not feel that the commission is slanted toward either side of the public-vs-private power viewpoint."

Court Orders Change in Appliance Store Name

Supreme Court suit of Rochester Gas & Electric Corp to stop a Webster man from using the words "Gas & Electric" in the names of two appliance stores he operates, one in Webster and another in Canandaigua, ended in a consent injunction compromising the litigation.

The judgment was ordered by Official Supreme Court Referee Fred D. Cribb on the basis of a stipulation agreed to by both sides. It gives the defendant, James B. Stark of Webster, until March 14 to change the names of his businesses from "Canandaigua Gas & Electric" to "Canandaigua Gas & Electrical Appliances" and from "Webster Gas & Electric" to "Webster Gas & Electrical Appliances."

It enjoins Stark thereafter from using the words "Gas & Electric" or "Electric & Gas" in the counties of Monroe, Wayne, Ontario, Cayuga, Allegany, Wyoming, and Livingston.

Under the judgment, Rochester Gas & Electric will reimburse Stark $1,000 for his expenses involved in changing the names of his stores in Webster and Canandaigua, the payment to be made upon notice that he has carried out the change agreed upon.

New California Projects

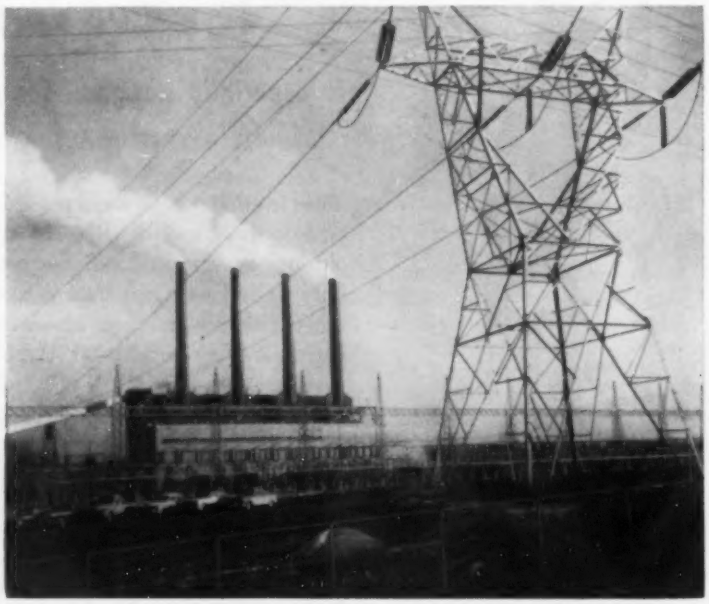
Preliminary work is expected to get under way this year on Southern California Edison Co's 126,000-kw Mammoth Pool powerhouse and reservoir. The project will provide the utility's seventh Big Creek powerhouse and its fifth major High Sierra reservoir. Also scheduled to get under way this year is the company's eighth Big Creek powerhouse—Portal Powerhouse, a 10,000-kw unit near Huntington Lake.

Con Edison, UWUA-CIO Sign 2-year Labor Pact

Consolidated Edison Co of New York and the Utility Workers Union of America—CIO have signed a two-year collective bargaining agreement with a reopening in December for wages, pensions, premium payments, work schedules, and holidays.

The principal contract terms are:

- A 5¢ an hour wage increase in maximum rates.
- A continuation of the wage "Progression Plan" for 1955.
- A freezing of Social Security deductions at the levels existing immediately prior to the 1954 amendments.
- A 2½¢ an hour special increase for employees earning below $2.10 an hour up to the new maximum rate or $2.15 an hour, whichever is lower.



New Unit Producing at Indiana PS Station

Fourth 100,000 kw generating unit was placed in operation this month at Public Service Co of Indiana's Wabash River Generating Station. Capacity of the $70-million plant will be increased still further when a 125,000-kw unit is added in 1956.

Coincident with the addition of the fourth unit, which has been in service on a test basis since early in December, Indiana PS system peak load reached an all-time high of 776,000 kw on Dec. 20, topping the 1953 peak load by 57,000 kw.

Over 15 years' experience in

"Putting on the Pressure"

is your proof that your

PENNSYLVANIA Power TRANSFORMER

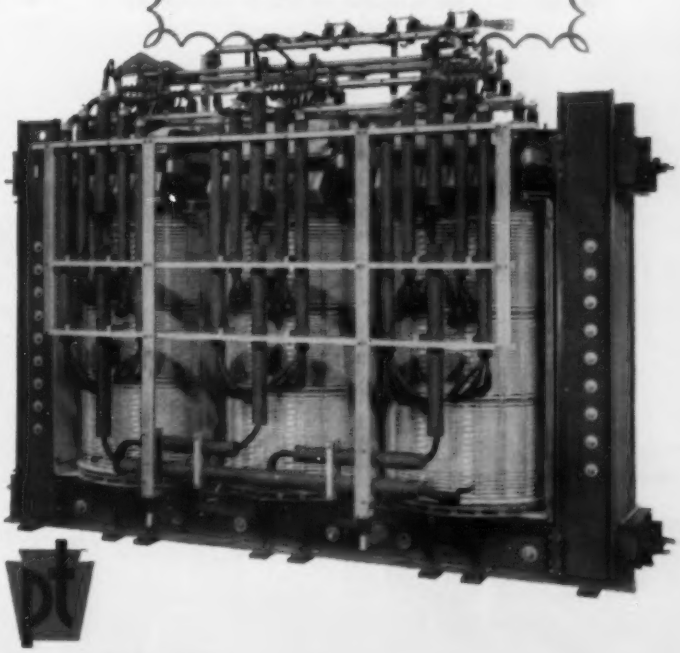
will withstand short circuits

Pressures up to 600,000 pounds can be applied to coils by this Pennsylvania hydraulic press.

When a large power transformer is subjected to a short circuit, a force of several hundred thousand pounds may be imposed axially on its coils. Of course, these short circuit forces are taken into account in the design of each transformer. But at Pennsylvania, "proof on paper" is not enough. Positive action is taken to be absolutely certain that your transformer will withstand short circuits. Putting on the pressure is the added measure of safety engineered into every helical and pancake coil. Pennsylvania engineers calculate the total short circuit force that would be produced by a short circuit at the secondary terminals with the rated voltage maintained on the primary. Each coil is then compressed with this predetermined force. Finally, the coil is treated in such a manner that it will maintain its compressed size and shape when mounted on the core.

This idea, as well as this method of precompressing coils, was devised by Pennsylvania Transformer Company over 15 years ago. It has been a regular step in Pennsylvania's manufacturing process ever since then.

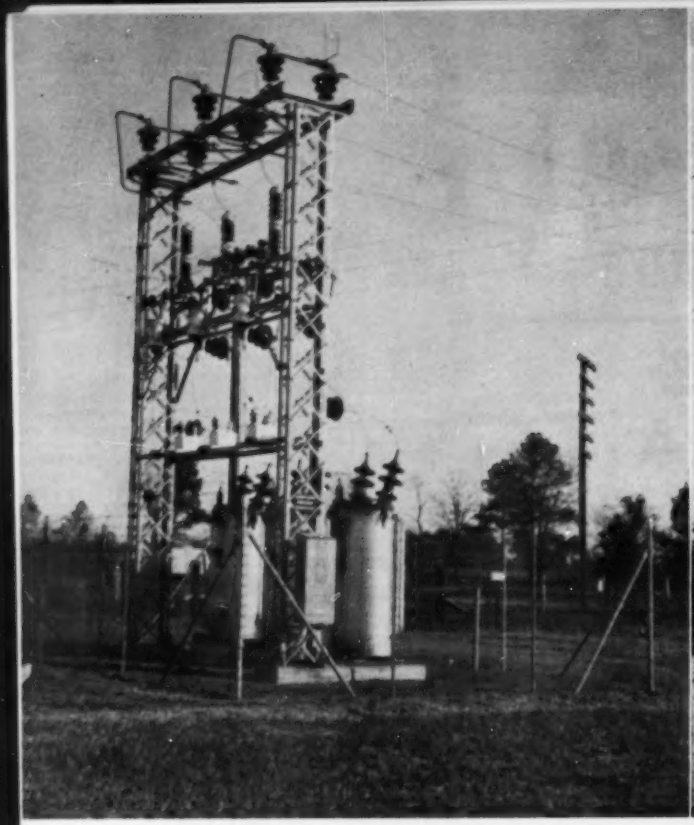
The fact that the transformer coils maintain their shapes under the prescribed pressure is your guarantee that the transformer will withstand short circuits.



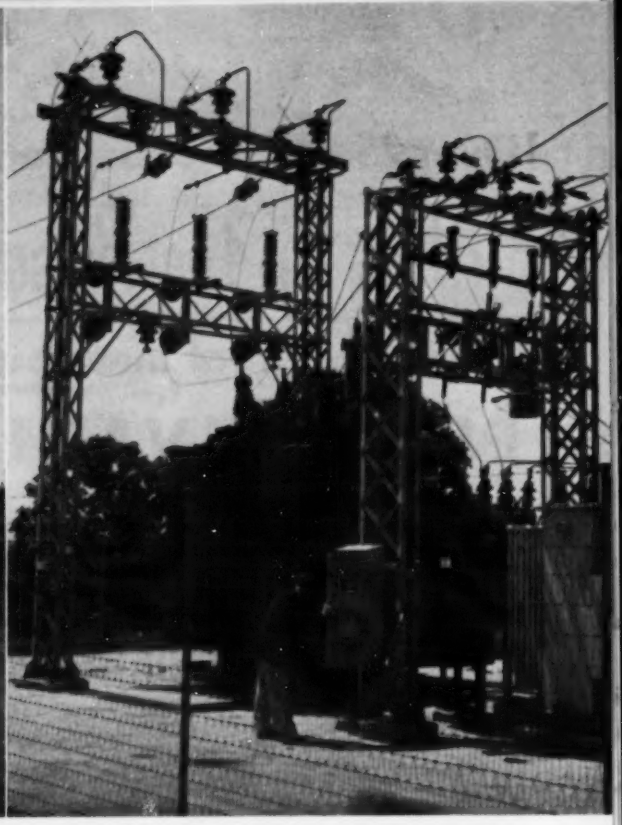
Core and coil unit of 20,000 Kva, three phase transformer. Strong supports are provided at the top and bottom of the coils to keep the coils in their precompressed shapes. No movement can take place in these transformer coils, even under the most severe short circuit.

PENNSYLVANIA TRANSFORMER COMPANY • **BOX 330, CANONSBURG, PENNSYLVANIA**

A McGraw Electric Company Division



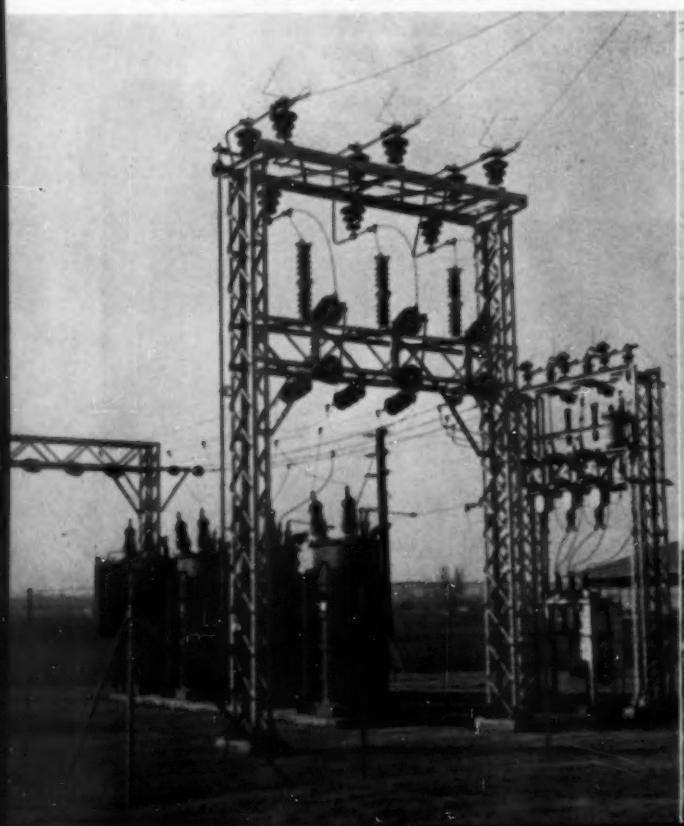
1 LARGEST STRUCTURE alone is used when substation can be dependent on oil circuit reclosers for low-voltage feeders

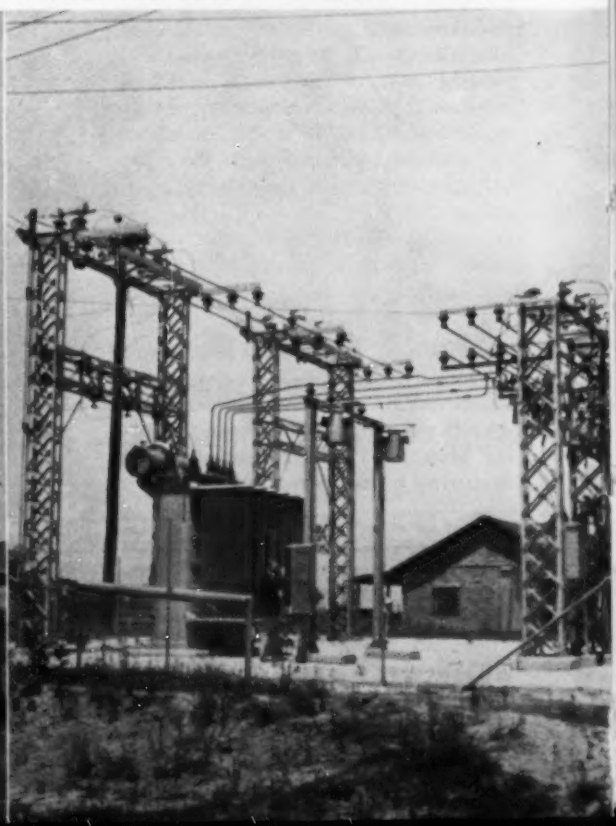


2 SMALLEST STRUCTURE is added to single-structure sub when capacity of station requires use of oil circuit breakers

3 ALL THREE STRUCTURES are used at substations where a spare transformer is required and at large industrial subs

4 STRUCTURE SPACING is increased where growth is expected to allow addition of low-voltage circuit breakers





Standardization Saves $230 per Structure

Flexibility and time saved in construction and provision for growth motivate Georgia Power's use of 1 or more of 3 simple substation structures

GUY M. CARTER, Engineer, Engineering Department, Georgia Power Co, Atlanta, Ga.

Standardization of distribution substation structures and layouts by Georgia Power Co provides greater flexibility, reduces structure cost by $230, and saves time when fast installation is required. Substations are now built with one or more of three simple structures which require a minimum of material for the initial installation. Future growth is provided for with little or no change simply by adding structures.

Three Substation Structures Used . . . The largest of the three structures has phase spacing for 44 kv and is 24 ft high with 14 ft between centers of columns. It will carry 1,200 lb tension per conductor and weighs about 2,500 lb.

Middle-size structure for deadend support of cable buses is 17 ft 4 in. high, 14 ft between centers of columns, and weighs about 1,900 lb. Its truss is at the same elevation as the truss in the larger structure.

Smallest structure used for feeder breakers up to 15 kv, is also 17 ft 4 in. high but is 9 ft 6 in. between centers of columns and weighs about 1,700 lb. It may be extended a bay at a time as new feeders are required. Brackets can be fastened on all structures to support tubular main and transfer buses up to 1¼-in. tube on 15-kv insulators and 2-in. tube on 7½-kv insulators.

Foundations are also standard for all three structures. Where line or bus tension must be held, a foundation developing the strength of the structure is used while a smaller foundation, good for safe wind load only, is used for other footings. When only one structure is used, a combination foundation supports both the structure and transformers, thereby taking advantage of the transformers' weight to save concrete.

Fig 1 shows the largest structure in a substation used for wholesale customers, industrial customers, and small distribution substations. The structure is applied to stations having three 500-kva, 44-kv, single-phase transformers or one 5,000-kva, 44-kv, 3-phase transformer.

Use of the single structure for distribution substation is restricted to those small enough to depend on oil circuit reclosers for the low-voltage feeder. When capacity requires an OCB, the smallest standard feeder structure is added, Fig 2. With further addition of bays to the feeder structure this arrangement is used up to a 5,000-kva, 3-phase transformer in distribution substations.

Type Installed For Industrial Substations . . . Fig 3 is a distribution substation, 44-4-kv wye, in an area where changing out a damaged transformer takes so long that spare transformer is necessary. This arrangement having all three standard structures is used for all capacities where four single-phase transformers are installed for customers or distribution. It is also used for industrial substations above three 833-kva, 44-kv, single-phase transformers or one 5,000-kva, 44-kv, 3-phase transformer.

In areas where two or more substations supply the distribution load, subtransmission is looped through each substation. Where growth is expected, structures are spaced to allow addition of low-voltage oil circuit breakers for each transformer without moving the feeders, Fig 4. A high-voltage oil circuit breaker and low-voltage bank breakers will be added with the second transformer bank. This arrangement is used for many industrial customers requiring dual feed.

Flexibility of the design facilitates changes. For example, an initial installation may be three single-phase transformers and subsequent steps may employ 3-phase transformers or vice versa. The high voltage can be changed from 12 to 44 kv without any change in the steel. Direction of the high-voltage lines relative to low-voltage feeders can be made to meet almost any requirement.

Standardization saves approximately $150 per structure in handling and erection. Steel details were worked out to make as few parts as practicable for all three structures. For example, column legs and bracing of all structures differ only in length. There are only 51 items for the larger structure including bolts and washers.

In handling these pieces repeatedly, the men have become so familiar with them that reference to blue prints is rare. When two or more types of structures were used, prints were needed on all jobs. Two men can easily load all pieces for a structure on the truck. The structure is often erected by hand without hoisting equipment.

Storage space is minimized by stacking the steel by pieces rather than bundling a complete structure. A substation is withdrawn from stock using a list of pieces for the required structures. When a structure is removed from a substation site, it goes back into stock so only the foundation is lost.

Structures are a standard stock item and are bought in large tonnage orders to take advantage of price discounts. At present prices, this saving amounts to about $80 per structure.

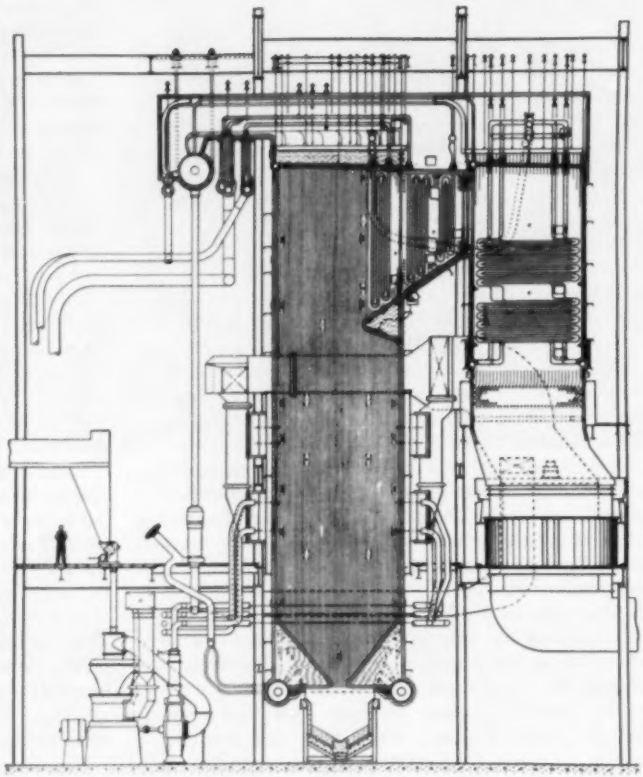
Initial installation of a 19-4-kv substation with one line and one feeder uses about 4,835 lb of steel while the minimum initial steel for a previous type was about 11,000 lb. The ultimate for the type in Fig 4 is 14,102 lb, against 21,200 lb for the previous type. A bare minimum of material is installed, and more is added only as needed.

Stocking structures and corresponding switches saves time in giving quick service when required. With growing distribution loads and emergencies arising with industrial customers, structures and switches in stock have "saved the day" on many occasions.

POSSUM POINT STATION

Virginia Electric & Power Company

C-E controlled circulation boilers



The C-E Unit shown above is presently under construction in the Possum Point Station of the Virginia Electric & Power Company at Dumfries, Virginia. Stone & Webster Engineering Corporation are the engineers and constructors.

It is designed to serve a 100,000 kw turbine-generator operating at a throttle pressure of 1450 psi with a primary steam temperature of 1000 F, reheated to 1000 F.

The unit is of the controlled-circulation, radiant type with a reheater section located between the primary and secondary superheater surfaces. An economizer section is located below the rear superheater section and regenerative type heaters follow the economizer surface.

Pulverized coal firing is employed, using bowl mills and tilting, tangential burners. Arrangements are made to use oil as an alternate fuel.

B-808

C-E

COMBUSTION ENGINEERING, INC.

Combustion Engineering Building
200 Madison Avenue, New York 16, N. Y.

BOILERS, FUEL BURNING & RELATED EQUIPMENT; PULVERIZERS, AIR SEPARATORS & FLASH DRYING SYSTEMS; PRESSURE VESSELS; AUTOMATIC WATER HEATERS; SOIL PIPE

Penn P&L's Quizzical Selling:

"30 Questions" promotion boosts sales 73% by teaching dealers, plumbers ABC's of selling electric water heaters

That salesmen who know their product sell more goods was shown in a unique "30 Questions" electric water heater promotion wrapped up recently by Pennsylvania Power & Light Co.

Program neatly combined a sales-getting incentive plan with some valuable instruction for dealers on how to sell water heaters. In five weeks 580 cooperating retailers and plumbers sold 1,596 units. Sales for the one full month in the campaign period showed a 73.2% increase over the average sales for the preceeding five months.

Here's how the promotion worked: Material announcing the program plus a booklet containing the "30 Questions" and answers on water heater selling was sent to dealers and plumbers. Those wanting to take part returned a postcard telling the company to "fire away with your 30 questions." Then, as sales were made by the retailer, he would file postcard reports with the company. Next, a PP&L "quizzer" would call on the dealer making a sale and ask him a question from the "30 Questions" booklet. Upon giving the correct answer the company would pay him $3 for his first report of a water heater sale, $4 for the second and $5 for the third and succeeding reports. For example, if a dealer had filed reports of four sales before the quizzer called, he could win $17. The "30 Questions" themselves ranged from "What is PP&L's electric water heating rate?" to "What is the comparable efficiency of electric vs LP-gas water heaters?"

The promotion, points out William M. Briggs, PP&L's Sales Promotion Director, accomplished three things:

1. It improved the area's electric water heater sales picture.

2. It helped retailers and plumbers to earn extra cash for themselves.

3. It enabled retailers, plumbers and their sales staffs to gain a better knowledge of the ABC's of water heater selling.

Says Briggs: "The enthusiasm of dealers generally was quite pleasing to us. They certainly did a grand job of studying the questions, and without exception gave the answers in rapid fire order."

Boston Gets Certified Lighting Program

National Lighting Bureau's Certified Lighting Program is getting started in the Boston area, under auspices of the Electric Institute Inc's Lighting Committee.

Certification authorities have been established in electric utility offices in the area, and training classes for lighting salesmen will commence in March. Julius Daniels, assistant to the commercial manager, Boston Edison Co, is chairman of the committee. This is the second local lighting bureau to go into operation under the Certified Lighting Program.

Lighting Sells Seat Covers

C.J. AAS, Sales Engineer, Northern States Power Co, Minneapolis

"Good lighting is one of the cheapest methods of advertising," says D. Goldman, owner of Rayco Auto Seat Covers in Minneapolis. "The merchandise is more easily seen, is more attractive, and thus easier to sell."

The Rayco store, by utilizing the latest in merchandising techniques, puts lighting to effective and sales-getting use. Brilliant signs and a lighted parking lot attract customers into its showroom. Wide expanses of glass front the store, turning the entire sales area into a massive window display. Good lighting permits both customers inside and passersby outside to view the merchandise mounted smartly on modern pegboards.

Lighting Installation Data

Fixtures in the Rayco sales area include:

Ten units—four lamps, 75 w, slimline, ceiling mounted, 5 ft 3 in. on centers.

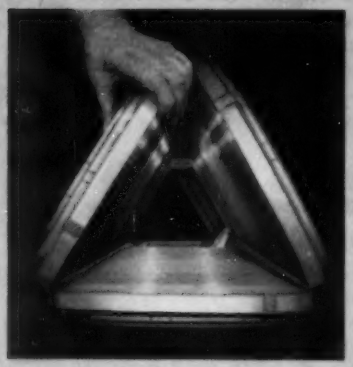
Twenty-nine units—150 w, recessed downlites with louvers, 2 ft 6 in. on centers.

Lighting levels are 125 to 175 ft-c. Installation gives approximately 85 ft-c of vertical illumination on the merchandise 36 in. above the floor.

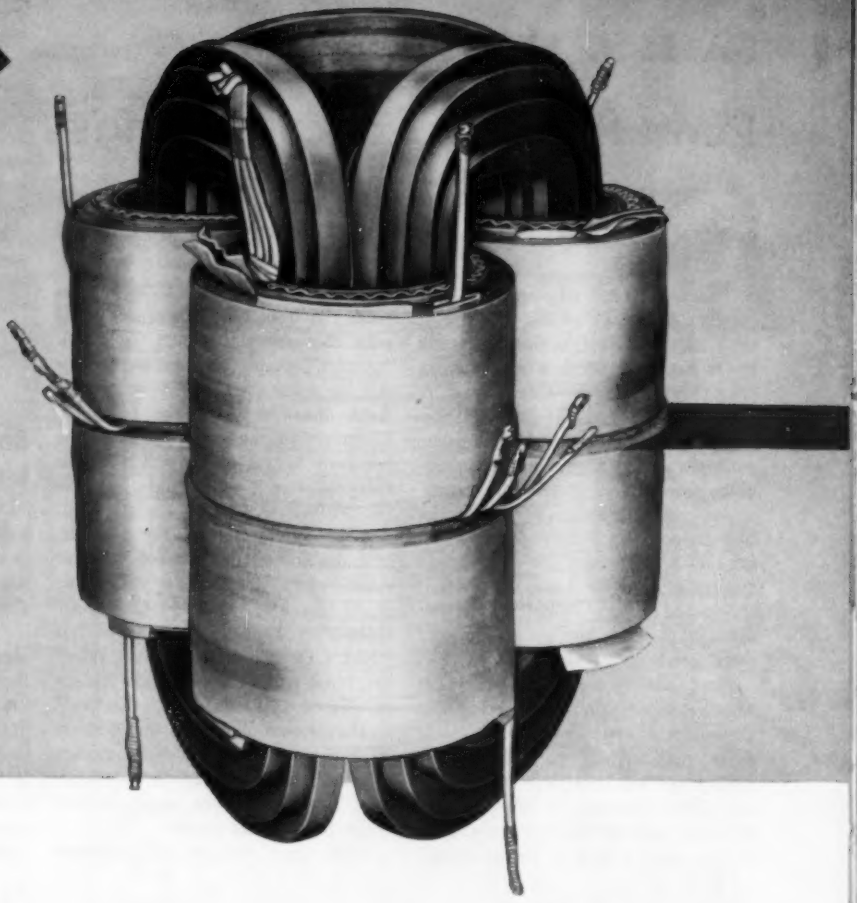
(*More S & S on page 55*)

MERCHANDISE DISPLAY can be seen both inside and outside store with this salesroom lighting which sheds 125 to 175 ft-c of illumination

The L-M Tri-Wound core-coil configuration results in a compact and highly efficient structure. The inherent characteristics of the continuously wound core and the round coils offer distinct design and operating advantages.



The core structure consists of three continuously wound cores of oriented-grain silicon steel strip assembled into a balanced magnetic unit.



The new Tri-Wound is built to resist short-circuit forces. Note the strong steel frame and heavy clamping bolts. Sturdy maple blocks at top and bottom are tightened and clamped against the coil ends to prevent axial movement.

Completed Tri-Wound 3-phase transformer. The unit is smaller and lighter than L-M's previous type. The transformer provides all the well-known advantages of L-M's single-phase Round-Wound transformers.

Outstanding Characteristics of L-M Tri-Wound Transformers

High short-time overload capacity

Good regulation at all power factors

High impulse level with ample creepage distance and generous insulation

High short-circuit strength

Filled with ORTO®, L-M's oxidation-resistant transformer oil, inhibited for longer life

Available in sizes 9, 15, 30, 45, and 75 kva

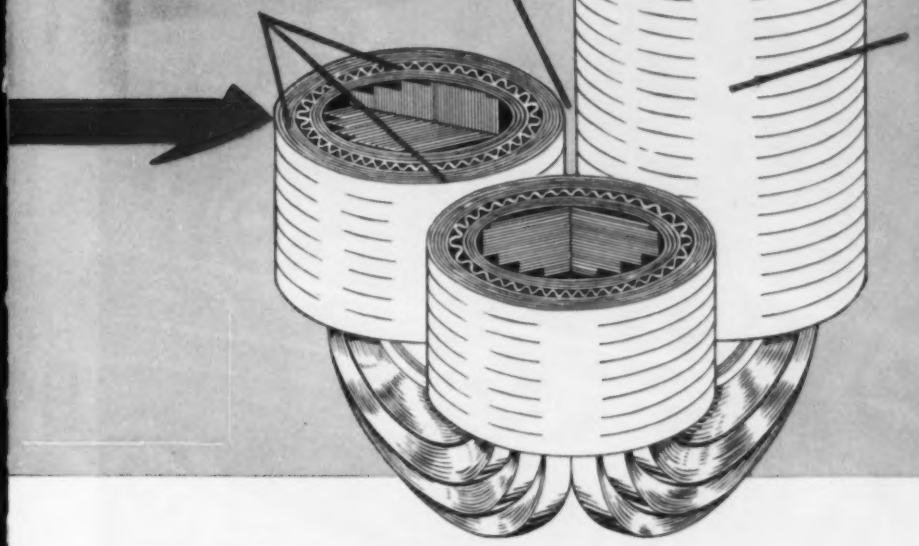
"Tri-Wound" and "Uni-Wound" are Line Material Company trade-marks.

High Short-Time Overload Capacity
Core clamps are designed to provide a chimney effect between the three coils. This chimney effect plus the exposed outer coil surfaces provides effective cooling. Oil ducts, located throughout the coil, contribute to uniform, efficient cooling.

High Impulse Strength
High-voltage windings are on the outside of the coils, providing maximum distance between the high-voltage line leads and the low-voltage windings and the core. This provides ample creepage distance with generous insulation.

Low Exciting Current
The continuously wound core of oriented-grain silicon steel strip provides a uniform flux path, thus permitting low exciting current.

High Short-Circuit Strength
Round coils naturally resist radial short-circuit forces without damage or distortion. Sturdy core clamps and strong blocking help prevent axial movement of the windings under short-circuit conditions.



For 3-Phase In 9 To 75 kva Sizes...

L-M's New Tri-Wound™ Transformers

Apply Round-Wound® principles to 3-phase construction to provide light weight and small size, high overload capacity, high short-circuit strength, high impulse strength.

By **JAMES G. EVERHART**
Chief Engineer
Transformer Division
Line Material Company

L-M's new *Tri-Wound* fills the need for a smaller, lighter 3-phase transformer that utilizes the full advantages of a continuously wound magnetic core and round coils. This new Tri-Wound transformer is now available in sizes 9 through 75 kva and in all voltage classes through 13,800 volts.

L-M's larger-sized 3-phase transformers are the new *Uni-Wound*, which provide Round-Wound's balanced performance in sizes from 112½ through 500 kva.

Continuously Wound Core

The Tri-Wound transformer consists of three cores, continuously wound of oriented-grain silicon steel strip. The bare cores are annealed after fabrication, and placed as shown in the illustration. Then round coils are wound directly onto the three core legs by L-M's exclusive winding process.

Tri-Wound is Smaller and Lighter

Integrating the core-coil assemblies into one unit provides a substantially lighter, smaller 3-phase transformer. For example, the 75 kva Tri-Wound is approximately 250 pounds lighter than previous designs. In addition, the over-all height of this new Tri-Wound unit has been reduced about 1½ feet, with very little increase in the projected floor space.

Balanced Performance

Performance characteristics of the Tri-Wound transformer have been coordinated to give good over-all balanced operation, with each characteristic being considered in its relationship to the over-all performance of the transformer.

Get Details of Tri-Wound Transformers

Ask the L-M Field Engineer to give you full details; or write Line Material Company, Transformer Division, Zanesville, Ohio. (Line Material Company is a McGraw Electric Company Division.)

192

LINE MATERIAL Transformers

Reduce brightness contrasts . . .
get efficient, over-all lighting with SYLVANIA'S

ALL-WHITE SLOTTED REFLECTORS!

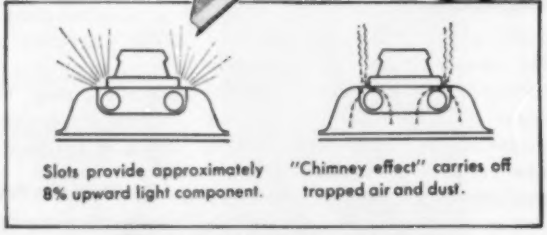
Now Sylvania introduces the Slotted Reflector . . . an improved industrial lighting design that results in far more efficient lighting *plus* lower maintenance costs!

The warehouse photo, above, shows how Sylvania's new Slotted Reflectors reduce brightness contrast by throwing an upward component of approximately 8% on the white ceiling.

And, because these slots are located just above the lamps, they create a "chimney effect" . . . carry off air normally trapped inside the reflector. This action also tends to remove dust and dirt accumulations . . . helps maintain high lighting levels.

These units are now available in all-white Miracoat or baked enamel, with open or closed ends. For full dimensional data and all details write to

Dept. 5X-2803, SYLVANIA ELECTRIC PRODUCTS INC., Salem, Mass. *In Canada: Sylvania Electric (Canada) Ltd., University Tower Bldg., St. Catherine Street, Montreal, P. Q.*



Slots provide approximately 8% upward light component.

"Chimney effect" carries off trapped air and dust.

LIGHTING • RADIO • ELECTRONICS
TELEVISION • ATOMIC ENERGY

Keep your eye on SYLVANIA

...fastest growing name in sight

Bright New Styles...

in home appliances spark hopes for bigger '55 sales at Merchandise Mart unveiling

Overall sales of major appliances should be up from 3 to 30% in 1955 over 1954, declares Parker H. Ericksen, executive vice president of Avco Manufacturing Co. Prediction was made at a press conference which opened the January appliance and furniture show in Chicago's Merchandise Mart.

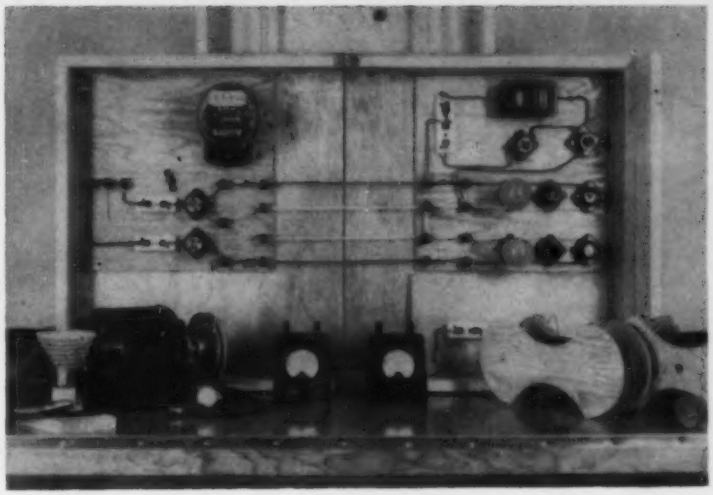
Ericksen said that dryers are expected to lead the 1955 sales gains with a 30% increase and air conditioner sales will be up 21%. Little change is expected in the range volume of 1,250,000 units sold in 1954, but he said that the figure could be boosted considerably if the same promotional, advertising and sales efforts were given to ranges that are being concentrated on refrigerators and automatic washers.

With that came the unveiling of the appliances on which the sales hopes for '55 rode. Everywhere the trend was toward more and more built-in equipment, bigger splashes of color, giant-size ovens and pushbuttons for controlling just about everything.

Some samples:

- Hotpoint's built-in "Kitchen of Tomorrow" with small appliances which emerge from wall at the touch of a switch.
- Frigidaire's built-in equipment, with French doors on ovens, surface heating units which fold up against the wall when not in use to provide extra working space.
- Westinghouse's 40-in. range with a 30-in. oven.
- Washers—General Electric's automatic washer-dryer combination; lower-priced automatic unit by Crosley; washer with a second cycle for fine fabrics by Hotpoint.
- Refrigerators—Kelvinator's upright chest-type refrigerator-freezer; Westinghouse units with automatic twin fruit juice dispensing fountains; General Electric's new wall-type now being put on the market for first time; Frigidaire with 10-w fan for circulating air within the unit.
- Air Conditioners — Westinghouse's ¾-hp heat pump type of room unit for both cooling and heating; General Electric's flush-mounted types with higher power factors; a dehumidifier made by Westinghouse with built-in electric heater.

One idea of what all this will do for the appliance market was voiced by H. B. Price, Jr., president of the National Appliance & Radio-TV Dealers Association a few days later at NARDA's Convention. Revolutionary styling advances like these, he said, already have obsoleted many of the appliances currently in use in the home today, and will rapidly bring about the obsolescence of most.



AW Goes to The Classroom

This wiring demonstration board together with instruction manual is being used by New York State Electric & Gas Corp to teach adequate wiring fundamentals at schools and group meetings. Suitable for classroom teaching, board can be folded up for carrying or mounted permanently on a wall. The 35-page manual contains series of nine demonstrations plus plans and material lists for building the board. NYSE&G's Farm Service Department hopes to reach 5,000 to 6,000 school boys annually in effort to teach them importance of proper farm and home wiring.

REA to Grant Loans for Off-Peak Controls

Rural Electrification Administration has announced it will permit REA co-operatives to obtain government loans to purchase 720-cycle off-peak water heater control systems.

Announcement was made after six-month-long tests of the control systems by five REA's in Wisconsin, Iowa, Illinois, Indiana and North Dakota.

Manufactured by General Electric Co the system provides automatic off-peak control for rural and residential electrical loads.

S & S Shorts

Cuts Color Tube Price

Radio Corporation of America has reduced the price of its 21-in. television color picture tube to TV set manufacturers from $175 to $100. RCA calls reduction another move to get color TV "off the ground" and into the market.

Portable Glass Space Heater

A new electric portable glass heating unit with a hard, high intensity glass which is said to withstand extremely high heat, has been introduced by Electriglas Corp, Bergenfield, N. J.

Priced at less than $60, the new product measures 17 in. high, six in. deep and 22½ in. wide. It utilizes 1,500 w of electricity.

Conditioner Sales to Climb in '55

Retail sales of room air conditioners should climb to 1.1 million units in 1955 compared with about 900,000 in 1954, predicts Cloud Wampler, president of Carrier Corp.

Change in Price Policy Studied

Escalation clause based on U. S. Department of Labor's Material and Labor Indexes being examined by manufacturers

Price escalation policy on long-term contracts covering particularly large apparatus is being studied by the electrical manufacturers. In general, current contracts carry a price provision (1), known as "price in effect at time of shipment," which provides for escalation by existing established indexes. One policy change promoted is an alternate price provision, (2) which provides for price adjustment based on changes in cost as evidenced by specified U. S. Department of Labor, Material and Labor Indexes. Both price provisions would be offered the purchaser for his selection.

The escalation policy change involves provisions such as:

• Quoted prices would be subject to adjustment upward or downward for changes in labor and material costs at the times when payments are made.

• The "labor index" would be the Average Hourly Earnings Index in the Electrical Generating, Transmission, Distribution and Industrial Apparatus Industry as determined monthly by the U. S. Bureau of Labor Statistics.

• The "material index" would be Steel Mill Products Index as determined monthly by the U. S. Bureau of Labor Statistics.

• The "base labor index" and "base materials index" would be determined by averaging the labor indexes and materials indexes respectively for the month in which the order was placed with the immediately preceding and succeeding months.

• For the purpose of price adjustments, 55% of the contract price and of each payment to be made on account would be deemed to represent the labor content. Also, 35% of the contract price and of each payment would represent the material content.

• The labor content and material content of each payment would be adjusted for any increase or decrease in labor and material costs respectively. The adjustment for labor and material would be equal to the percent by which the labor index (similarly the materials index) for the month in which the payment is due is greater or less than the base labor index (likewise base materials index).

• The labor content and the material content of any part of the contract price due on or after shipment would be adjusted as of the scheduled date of shipments.

• If shipment is delayed due to causes beyond the manufacturers reasonable control, the labor and materials indexes for the month in which shipment is made would be used for the purpose of price adjustments.

• If a change in contract specifications prior to shipment results in a change in contract price, the new price would be considered as having been in effect since the order was placed for the purposes of price adjustment.

• If the labor and material indexes would be discontinued, substitute indexes would be used by mutual agreement of the parties.

• The base labor index would be determined to the nearest one hundredth of one percent. The base materials index would be determined to the nearest one tenth of one percent.

• Both labor and material adjustments would be calculated to the nearest one tenth of one percent.

125,000-kva LTC Transformer Shipped

First load-tap-changing transformer rated 125,000 kva has been built in Moloney Electric Co's new large power assembly bay. It is the largest transformer reported to be produced west of the Mississippi River. The unit was shipped recently to Union Electric Co for installation at the Cahokia, Ill., steam generating plant. It will serve as a bus-tie between the 13.8 kv generating bus and 138 kv transmission bus.

This oil-immersed, forced-oil-cooled and forced-air-cooled unit has connections for 138 kv grounded wye and has two independent 13.8 kv delta voltage windings each rated 62,500 kva. Load-tap-changing equipment provides plus or minus 10% regulation in 32 equal steps of 5/8% each.

"All-Brite" of California Moves to New Plant

"All-Brite" Fluorescent Fixtures of California has completed a 66,000 sq ft home in South San Francisco. Here has been consolidated offices, research and manufacturing. The one-story plant features reportedly the latest production line methods and techniques for the manufacture of fluorescent and slim line lighting fixtures.

According to chief engineer Robert Thallon, consolidation of all operations on one floor plus automatic

(*Continued on page* 59)

POWERS *American*

presents the

"Sky-Master"

HYDRAULIC AERIAL BEAM

THE ULTIMATE IN AERIAL EQUIPMENT

IN TWO SIZES... FOR ALL TYPES OF OVERHEAD WORK

SKY-MASTER carries two men . . . in reinforced plastic work baskets . . . to *any* point within its wide range of movement. The supporting mast, which rotates on roller bearings, can be revolved continuously . . . in either direction. The hydraulically-actuated inner beam can be moved to any point in an 85° arc, and the outer beam—actuated in combination with drive pulleys and ¾" wire rope—can be spotted in any position within a 265° arc. Movement of the beams and mast is controlled by three independent levers beside the work baskets. Hydraulic outriggers, on each side of the body, furnish absolute stability regardless of SKY-MASTER'S position. Insulation against 50,000 volts is provided by an abrasion-resistant covering on the outer beam.

Operating features and construction details are described in Powers-American Bulletin No. 410. A copy, with price information, will be sent on request.

SKY-MASTER can be installed on a Powers-American Body which fits individual work requirements. SERIES AB-37 has a ground-to-basket floor height of 37', SERIES AB-43 extends to 43', enabling two men to work 48' above ground.

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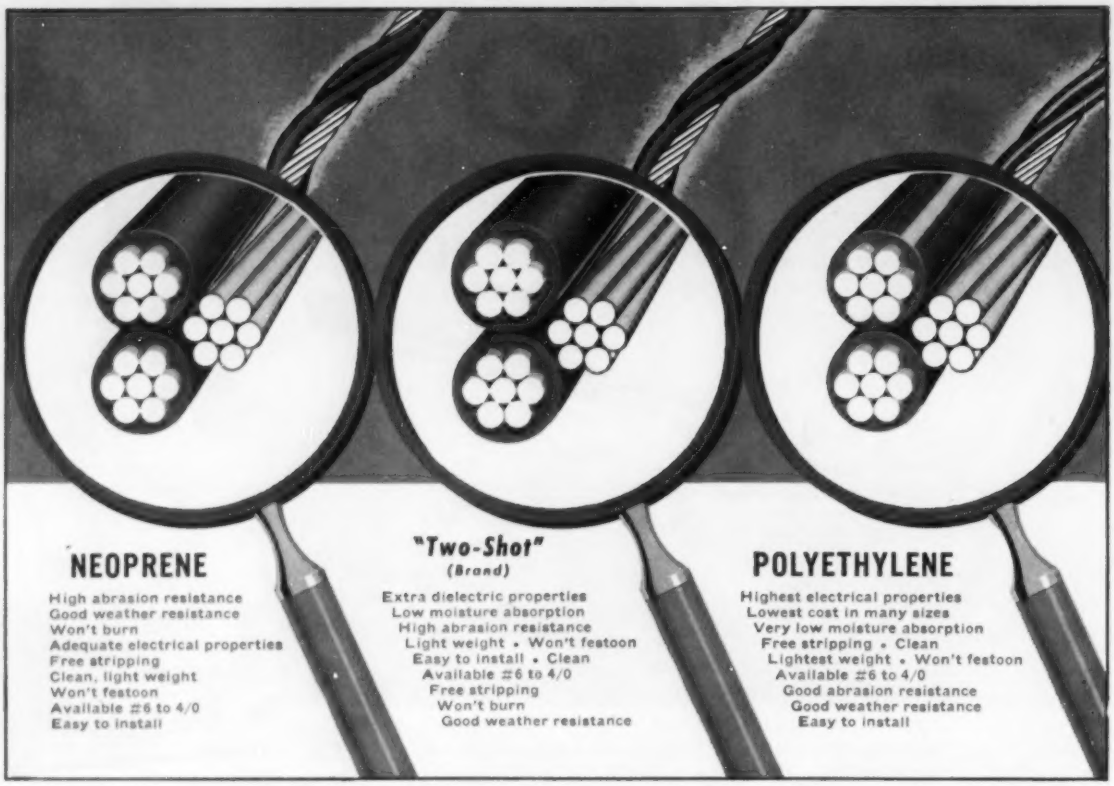
Choose your service drops from the K/W. TRIPLEX TRIO



YOUR CHOICE of service drop insulation is readily available in Kaiser Aluminum's K/W Triplex Trio.

Whether you prefer Neoprene or "Two-Shot" or Polyethylene, you can specify K/W with full confidence of getting the highest quality materials to meet your needs.

For example, if you want a premium-type product, you can order K/W's long-accepted "Two-Shot" Triplex at slight additional cost. The phase wire insulation—a 2/64" inner layer of special rubber (3/64" on stranded wire) with 2/64" jacket of tough Neoprene. "Two-Shot" Triplex provides added dielectric properties and weather resistance.

Otherwise you can specify regular K/W Neoprene or Polyethylene insulated Triplex or covered line wire for open wire services. No matter which conductor you choose, you are assured of long trouble-free service when you use Kaiser Wire.

If your services go through trees, ask your Kaiser Aluminum conductor engineer for advice on suppliers of economical tree guards, or you may want to consider a new Kaiser Aluminum development—"Double D Armored SD."

For complete information on Kaiser Aluminum conductors, contact our sales office listed in your telephone directory or one of our many distributors. Kaiser Aluminum & Chemical Sales, Inc., *General Sales Office*, Palmolive Bldg., Chicago 11, Ill.; *Executive Office*, Kaiser Bldg., Oakland 12, Calif.

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"All-Brite" Moves

(*Continued from page 56*)

equipment will provide more efficient materials and product handling. The Ransburg electrostatic paint process being used is one of two such installations in the country to date in the lighting industry.

Founded in San Francisco 10 years ago, the company has made four moves; each time to larger quarters to meet increasing product demands. Number of employees will remain at about 170.

Penna. Transformer Gets Big Contract from AG&E

Pennsylvania Transformer Co of Canonsburg, Pa., received contracts totalling almost $1 million from American Gas & Electric Service Corp of New York. The orders are for power transformers to be used by several of the operating companies associated with AG&ES Corp.

W. R. Swoish, vice president of Pennsylvania Transformer Co, revealed that the orders included a 260,000-kva FOA transformer with a high-voltage rating of 138 kv. This transformer is one of the largest transformers to be put into service in this country and also the largest one ever manufactured by Pennsylvania Transformer Co. It is scheduled for delivery in the summer of 1956 and will be installed at Ohio Power Co's Muskingum River steam electric station near Beverly, Ohio.

Most of the other transformers to be built for AG&E are scheduled for delivery sometime during 1955, according to the manufacturer. They include one 50,000-kva autotransformer with load changing equipment, two 37,500-kva transformers, and one 25,000-kva unit. Various smaller sized transformers also are included in the contracts.

Philco Has Sales Suit

Philco Corp, radio and appliance manufacturer, has been charged with sales restrictions at both the wholesale and retail levels. A civil antitrust suit has been filed by the Justice Department in the U. S. District Court in Philadelphia.

WESTINGHOUSE's new distribution transformers are exemplified by 10-kva unit. Vice Pres F. L. Snyder, left, and G. A. Fadler, purchasing agent, discuss steps taken to get quality

Westinghouse Alerts Suppliers to Quality

Quality product depends on quality in raw materials and parts. This was the general theme presented by Westinghouse Electric Corp when it was host recently to about 90 representatives of some 40 suppliers.

The representatives were invited to Westinghouse Sharon Works to see the new line of distribution transformers and to learn of their contribution. There the suppliers heard department heads explain the problems on quality; how the company is endeavoring to improve communication with the suppliers; and how the suppliers, by being aware of their responsibility for performance of materials and parts, will know a quality product can be produced and the supplier enjoy more business.

In his welcoming remarks, Frank Snyder, vice president, said, "The general objective is to further improve relations with suppliers so that together we can supply the best quality product and pass it on to the utilities and they in turn to their customers.

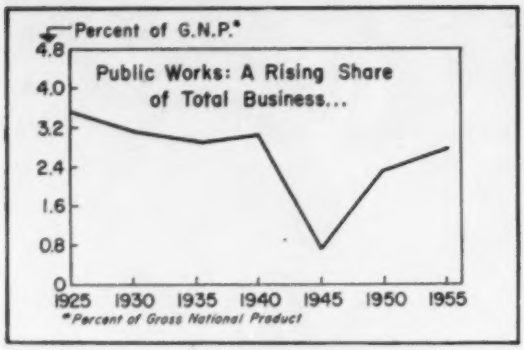
"Why are you here? We want you to know what we are doing to provide quality. We in purchasing want to carry out objectives" said George A. Fadler, purchasing agent. The objectives are:

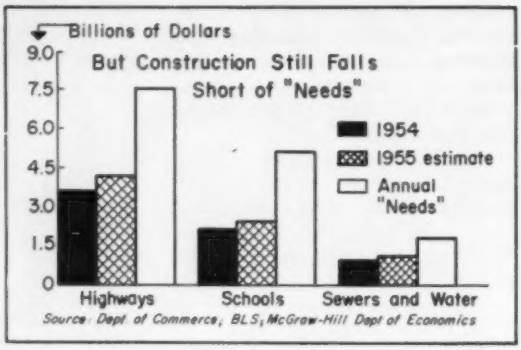
- Get the proper material when it is required.
- Obtain consistently the most favorable combination of quality, service, price, technical assistance, and assurance of supply on a long range basis.
- Obtain for Westinghouse a competitive advantage by getting the use of the knowledge of our suppliers in advance of our competitors. To do this successfully, we must communicate and interpret our needs to our suppliers.
- Set up an incentive system for our suppliers which will inspire them to do the best possible job of furnishing us our requirements,
- Maintain a relationship with our suppliers which will facilitate the accomplishment of all of our corporate objectives, including procurement, sales and public relations.

In design and manufacturing, J. H. Chiles, manager of engineering, put emphasis on keeping to specifications and quality of material so they do not need to design materials that are not up to desired tolerances and quality.

Among the quality problems is the reworking of poor material which increases costs and finished product price, stated John Bell, superintendent of Quality Control. He indicated 2500 instances of rejected material in one year. These were 8 to 10% of purchase orders. He expects 2 to 3% as ultimate.

ELECTRICAL BUSINESS OUTLOOK





Increased Public Works Affect Utilities

Most of the big postwar backlogs are gone. That's been one of the key facts about the United States business scene for the past two or three years. All those pent-up consumer wants—for new cars, new refrigerators, new houses—that powered the postwar boom are just about satisfied.

All this is common knowledge. But it is not true that all the postwar backlogs are gone. As a matter of fact, the biggest one of all—the backlog of public works—is still with us. And it is going to have a major effect on the economy for a good many more years.

Operations of electric utilities feel the effect of public works in quite a few ways. Many public works don't require much electricity, to be sure—highways, for instance. But some, like hospitals and public office buildings, can handle a respectable electrical load.

Impact On Utilities . . . But the major importance of public works to utilities comes from indirect effects. Their financing means extra burdens for utilities. A new highway, for instance, may be financed by tax revenue. Chances are, that means higher taxes for utilities. Or it may be financed by public borrowing. And that means added competition for the supply of lendable funds.

This competition is likely to be especially rough for utility bonds if the borrowing is done by state or local authorities, because they are more likely than the federal government to borrow for a long period—like utilities—and they offer the incentive of their tax-free status.

On the other side of the ledger, new public works can help build loads in some localities. This can happen either directly, through power sales to a new facility, or indirectly; a new school, for instance, can make a neighborhood more attractive and bring in new customers, or a new highway may bring in industry that wants to use it for transportation.

Anyway—good, bad or indifferent—electric utilities are going to have to live with the effects of a rising volume of public works for a long time to come. The charts above give some idea of the reasons why this is so.

The fact is that the United States has failed—because of war, inflation and depression—to provide adequate volumes of necessary public facilities for the past 25 years. Even in the thirties, when Washington seemed to be up to its neck in public works, the actual amount of public building was a relatively small part of total business. (See first chart.) And, once the second World War started, public building began to fall far behind increases in population.

Public Works Spending Increases . . . And these needs are going to be met—at least much better than they have been in the past few years. Two of the reasons for believing this will happen appear on the second chart above.

One reason is that spending on public works finally is increasing, and rapidly. The states and local communities which do most of this work have finally worked out enough of their financial problems to begin catching up on needs.

The other important consideration is the unfavorable comparison that still exists between reasonable estimates of public needs and the present volume of construction. Of course, some of the estimates of "needs" are greatly exaggerated; they call for the ultimate, and the ultimate can rarely be expected in the area of public building. But the estimates of the chart above are fairly reasonable.

So, volume of public works is going to increase, probably for many years; and utilities will have to live with the results, both good and bad. This volume undoubtedly will not increase as much as some enthusiasts would like. The President, for instance, probably won't get the $10 billion annual road building he wants.

On the other hand, pretty soon we will be spending more on new highways every year than we now spend for highways, schools, hospitals and public housing together. And those other items will probably be larger, too.

You may be throwing away your profits...

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The tremendous progress in instrumentation that has come out of Honeywell's intensive development program has made many older instruments obsolete. Modernizing your plant instruments, to take full advantage of this progress, can bring you a number of specific benefits.

You can save labor . . . by utilizing centralized control, automatic time-cycle systems and other concepts that save steps and reduce routine man-hour expenditures. You can cut maintenance . . . by installing instrumentation that is not only easier to service, but also requires the absolute minimum of attention. You can reduce rejects . . . because modern controls can maintain the tighter processing tolerances needed for today's exacting specifications. You can improve product quality. And you can make your cost accounting more accurate than ever before.

Replacing old instruments with new can well prove one of the best ways to invest your modernization appropriation. A Honeywell application engineer will be glad to survey your present plant instrumentation. Call him today . . . he's as near as your phone.

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IN THE INDUSTRY

The day of reckoning is near for three financially shakey public power agencies. These agencies, federal and state, have long been protected by paternal federal administrations biased in favor of public power. Now these three face the task of explaining the red ink on their balance sheets.

Sound Business Principles for Power Agencies

Southwestern Power Administration, which markets power from federal hydro projects in the southwest, is first up. It is seeking Federal Power Commission approval for a new and considerably higher rate schedule which will more nearly reflect its operating costs.

Long in Red . . . Government audits show this agency operated in the red during fiscal 1952 and 1953 to the tune of $1½ million. In the wake of continued drought conditions in the area combined with questionable operating procedures, it is almost certain that this deficit has continued into the present year.

SPA rates to preference customers—mainly rural electric cooperatives—are in the neighborhood of 5.6 mills per kwhr. Proposed new rate would be nearer 7.1 mills with a 10% discount (6.4 mills) until additional federal hydro capacity is installed in the area. According to the proposed schedule, the agency will no longer undertake to supply the entire power needs of its customers (EW, Jan. 24, p113).

Southeastern Power Administration is in a similar boat although it has been operating on a much smaller scale. Most recent audit available on the agency shows it is also operating at a deficit and still lacks FPC approval of its rate schedule.

In a different category is the South Carolina Public Service Authority, a semi-independent state agency which generates, transmits, and sells power in the central part of the state. Outgoing Gov James F. Byrnes indicated that this agency faces a deficit of around $750,000 for the current year (EW, Jan. 24, p112). A considerable share of its output from both hydro and steam plants is sold under a 35-year contract with a federated cooperative comprised of 16 distribution co-ops in the state. Unless the authority can negotiate a rate increase beyond the terms of the existing contract, it is headed for deeper deficits.

No Surprise . . . Although these situations may shock the taxpayer, they come as no surprise to the electric companies operating in the areas. In all three cases companies have loudly and frequently warned of the unsound economics implicit in the planning and operations of these public power agencies.

In the case of SPA the agency sought to sell power on a firm basis from hydro installations planned primarily to produce peaking power. From an operations standpoint this was an unsound practice from the start. Initial rates were set low to build up support for the agency. For some time it has been recognized that the only reasonable solution is for SPA preference customers—rural co-ops and municipalities—to integrate their systems with electric company systems in the area. In such a way the SPA power could be used for peaking on an economic basis.

Sepa, too, can market its power economically if it is sold mainly for peaking purposes. A "wheeling" contract with Virginia Electric & Power Co serves that purpose, and other contracts to be negotiated will have to be along similar lines.

The situation in South Carolina is more complicated. Officials of the public power authority there were instrumental in organizing a federated co-op to purchase power from the authority. The co-op borrowed more than $10 million from the federal government to build the transmission network necessary for carrying authority power to distribution co-ops. At the end of the 35-year contract, the authority may acquire this transmission network.

Congress, in creating SPA and Sepa, directed that the agencies should market power from federal dams in a manner "consistent with sound business principles." Clearly the South Carolina Authority was conceived with the same objective in mind. Taxpayers this year may have the opportunity to see whether administrators of these agencies have followed the law. A legislature committee will likely look into the situation in South Carolina. FPC hearings on rate schedules could open up the situation with regard to SPA and possibly Sepa.

TECHNICAL NOTES

Sites for power plants with ample cooling water are progressively harder to acquire. More tie lines will be needed to take the capacity to the load.

Operators and maintenance men who have transferred from indoor to outdoor plants are unanimous on one system in their preference for the outdoor plant.

Communication, navigation, indication, and control services demanded by modern living have to be rendered, "if by air" within the spectrum between 20 kc (top of audible sound) and 1,000,000 mc (bottom of visible light). Channels in the sky are *not* infinite in number.

Tide rise in the La Rance estuary on the French channel coast is 40-45 ft, and a barrage is contemplated to develop the hydro power.

Germanium content of flyash ranges from 15 to 90 ppm. Finer particles of the ash are generally richer (290 to 530 ppm) in germanium than the coarser sizes. Slag pits and furnace-bottom hoppers show comparatively little germanium content.

Selenium rectifiers can be operated at cell temperatures above 75C, but aging accelerates with temperature. Excessive temperature is likely to result in rapid failure.

Hydro Outlook . . .

. . . favorable in Northwest, survey finds. Dry spell continues in TVA and Southwest areas

A survey of United States water conditions for hydro output has revealed that favorable flows have been reported for the Pacific Northwest, but shortages plague the Tennessee and Southwest areas.

Favorable water conditions now exist in the Pacific Northwest, according to the Bonneville Power Administration. The same situation also prevails in the areas of Alabama Power and Georgia Power Companies.

Northwest Conditions . . . BPA reports that normal winter stream flows in the Pacific Northwest power pool area can assure all firm and interruptible energy loads to be carried through the winter by hydro generation. Reservoir resources from the favorable water year of 1954 also mean that even under the most adverse flow conditions in the Columbia Basin, BPA could carry all of its loads without use of steam through February.

But as the agency looked favorably upon the remaining months of the 1954-55 storage drawdown season, snow survey reports from throughout the Columbia Basin dimmed the outlook for 1955-56 unless rain and snow in the remaining winter months are above average fall.

Below average rain and light snowfall has prevailed generally in the basin drainage area. Generally, the basin receives 40% of the total winter's snow by Jan. 1, but this year only 30% of normal has fallen.

Tennessee Valley Authority, whose 30 dams have been experiencing low water levels for some time, has disclosed that the system's area has had a 2.35 in. rainfall as of Jan. 23, compared with 9.85 in. for January, 1954. But TVA said that its normal flood season starts in January.

Coosa River Flow Good . . . In the nearby area of Alabama and Georgia, favorable conditions exist in the territories served by Alabama Power and Georgia Power. Alabama Power has revealed that flows are very good on the Coosa River for its Lay, Mitchell and Jordan Dams. Georgia Power has reported that good flows on the Chattahoochee River are helping its reservoirs to build up.

Southwestern Power Administration is optimistic about water conditions in its territory despite a lack of average runoff conditions. SPA, which has not been able to resume full contract commitments, expects conditions to improve with continued average rainfall.

Despite the dire need of water by Texas ranchers and farmers, the Lower Colorado River Authority has revealed that it has adequate power to meet all commitments. The authority reports that its six lakes have a 91% capacity.

Meter Reader Supplies Own Protection

Bud Craber, meter reader for Arizona Public Service Co at Ajo, Ariz., used to be troubled by yapping dogs, pugnacious cats, and other forms of residential hazards. But that's all over now—ever since he started taking his own dog along on the rounds. The "pup" is Kim, burly Great Dane.

Washington Checklist

Southwestern Power Administration—Sen Robert S. Kerr (D-Okla.) is leading movement to increase the $1.3 million asked by Eisenhower for SPA in fiscal 1956. Kerr also wants $830,000 to let the agency continue to buy and resell power for the remainder of fiscal 1955. Money for this purpose runs out Feb. 18.

Federal Power Commission—Vermont Electric Cooperative, Inc, has asked FPC for a license for 6,000-kw hydro electric project on Lamoille River.

Elk Grove Irrigation District, Calif., asks preliminary permit for 332,200-hp hydro project in El Dorado and Placer Counties.

J. Kay Lindsay assumes duties as FPC Director of Administration.

Bills Introduced

State Licensing: To authorize state licensing of intra-state dams on navigable waterways. (HR 254)

Arkansas-Oklahoma Compact: To grant consent to compact regarding Arkansas River. (HR 208)

Canton, Washita Projects: To authorize federal construction. (HR 219, HR 310)

State Law: To require federal agencies to submit to state laws regarding water control. (HR 741)

White River: To provide additional hydro development. (HR 851)

FINANCE AND REGULATION

Western L&T Receives $297,000 Rate Boost

In an order, notable for its briefness Kansas Corporation Commission granted Western Light & Telephone Co, Kansas City, Mo., an electric rate increase of $297,000 a year or 69% of its requested $430,900. This order, dated Jan. 6 stated that "The primary purpose of the proposals of the applicant is to increase its revenues, but they have the further purpose of removing certain inequitable, preferential and otherwise discriminatory rates that result from the application of the presently filed schedules."

In addition, the commission noted that "Western Light has experienced substantial increases in its operating costs, and in addition thereto is faced with a further increase in wages of certain of its employees and the cost of fuel for its generating plants."

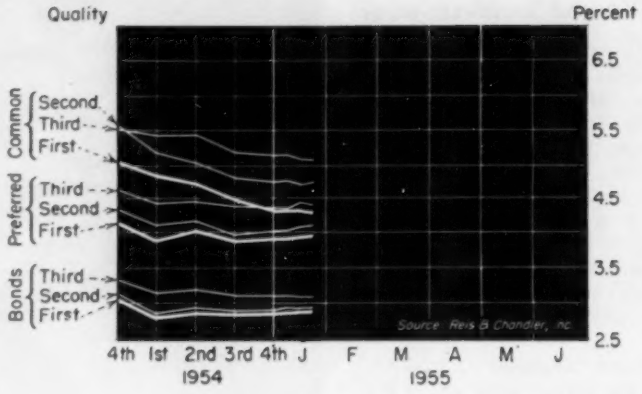
In its findings, the commission stated "That predicated upon a complete canvass of the entire record, Western Light should be permitted to file a schedule of charges to augment its present revenue in the amount of $297,000 annually, based upon actual sales for the 12 months ending Oct. 31, 1954."

FINANCIAL BRIEFS

Central & South West Corp will earn about $2 a share on a consolidated basis in 1954, Pres John S. Osborne told the New York Society of Security Analysts. This compared with $1.53 a share in 1953. System is expected to sell $8-$10 million of Public Service Co of Oklahoma preferred stock; $6 million of Southwestern Gas & Electric Co preferred stock; and $7.5-$8 million of West Texas Utilities Co bonds in 1955.

Southern Co will pay March 5 a quarterly common stock dividend of 22½¢ a share as compared with 20¢ previously . . . **Carolina Power & Light Co** has sold 50,000 shares of 4.20% serial preferred stock to institutions . . . **Maine Public Service Co** is planning to sell $2 million 3.35% bonds due 1985 to the Aetna Life Insurance Co.

Today's Utility Yields (%)



	BONDS			PREFERRED STOCKS			COMMON STOCKS		
QUALITY.....	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
Jan. 20.....	2.93	2.97	3.11	3.98	4.09	4.40	4.34	4.74	5.09
Jan. 13.....	2.90	2.94	3.11	3.95	4.08	4.40	4.34	4.72	5.10

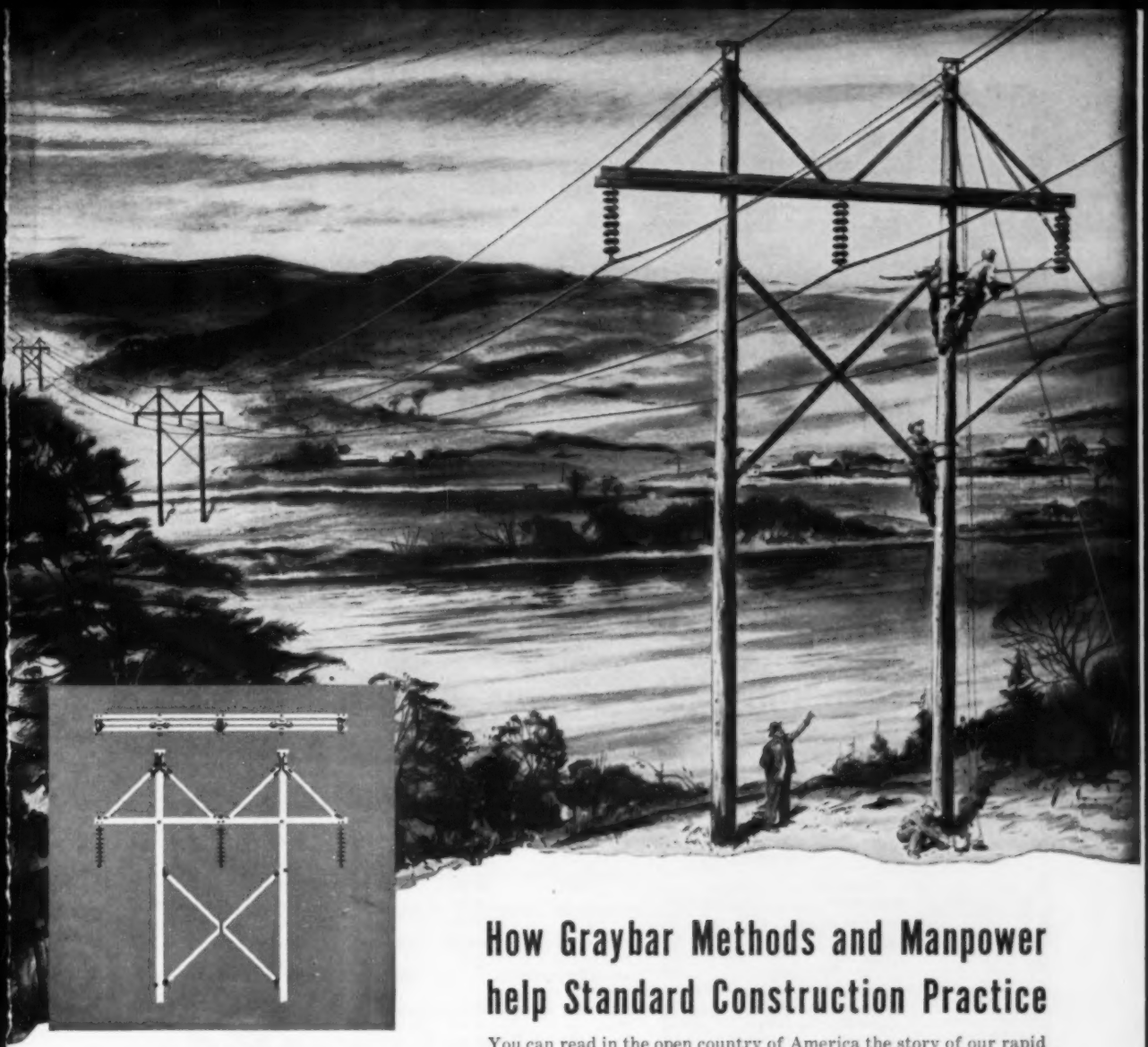
Utility Earnings

COMPANY	PERIOD MONTHS	ENDED	NET INCOME 1954	NET INCOME 1953	EARNINGS PER COMMON SHARE 1954	EARNINGS PER COMMON SHARE 1953
Carolina Power & Light(a)...	12	Dec.*	$7,846,241	$7,319,255	$....	$....
Pacific Power & Light.....	12	Nov.	5,540,535(b)	6,295,567(b)	1.47(c)	1.70(c)
San Diego Gas & Electric.....	12	Nov.	5,320,049	4,576,452	....	....
Texas Electric Service.....	12	Nov.	10,269,358	8,977,111	....	....

Notes—*Subject to year-end audit; (a) Hurricane "Hazel" caused about $650,000 damage in October 1954 of which about $543,000 was charged to operating expenses and the balance was charged to plant accounts and depreciation reserve; (b) After provision for federal income taxes deferred; (c) Based on 3,335,338 shares 1954 and 3,328,194 shares in 1953.

Utility Financing

COMPANY AND DESCRIPTION	AMOUNT OF OFFERING (000)	OFFERING PRICE	YIELD TO PUBLIC
WEEK OF JANUARY 20-25			
BONDS			
Consumers Power—1st mtg 3¼% due 1990.....	$30,000	102.325%	3.14%
PREFERRED STOCK			
Duquesne Light—160,000 sh $2.10 $50 par.....	$8,000	$51.34	4.09%
COMMON STOCK			
Missouri Utilities—27,420 sh (being offered common-holders on a 1-for-10 basis, record Jan. 12 to expire Feb. 8 with an oversubscription privilege).....	$569	$20.75	5.98%
SCHEDULE FOR JANUARY—FEBRUARY—MARCH			
BONDS AND DEBENTURES			BID DATE
Los Angeles, Calif., Department of Water and Power electric plant revenues.....	$18,000	.....	Jan. 26
Dallas Power & Light-debs due 1980.....	7,000	.....	Feb. 14
Kansas City Power & Light—1st mtg due 1985.....	16,000	.....	Feb. 15
Texas Electric Service—1st mtg due 1985.....	17,000	.....	Feb. 23
Kansas Gas & Electric—1st mtg due 1985.....	10,000	.....	Mar. 15
PREFERRED STOCK			
Kansas Gas & Electric—60,000 sh $100 par.....	$6,000	.....	Mar. 15
COMMON STOCK			
Central & South West—600,000 sh.....	.....	.....	Mar. 1



Type No. 702 —
Tangent Structure with braces . . .
for voltages 69 to 154 KV*

LIST OF MATERIAL

Quantity	Description
2	Crossarm
3	Steel spacer w/mounting bolts
2	Stud bolt ⅞" w/washer nuts and locknuts
1	Bent stud bolt ⅞" x 8" w/2 sq. nuts
2	Bent bolt ⅞" x 5½" w/sq. nut
4	Vee Brace 3½" x 4½" cross section
1 set	Cross brace w/fittings, clamp, ⅞" pole bolts, curved washers
2	Static wire support
4	Machine bolt ¾" w/locknuts
2	Clevis
2	Suspension clamp for static wire
as req'd	Suspension insulators & fittings

How Graybar Methods and Manpower help Standard Construction Practice

You can read in the open country of America the story of our rapid growth in production capacity. New transmission lines, reaching out over plains, mountains and rivers foretell our multiplying strength in building for defense and for better living.

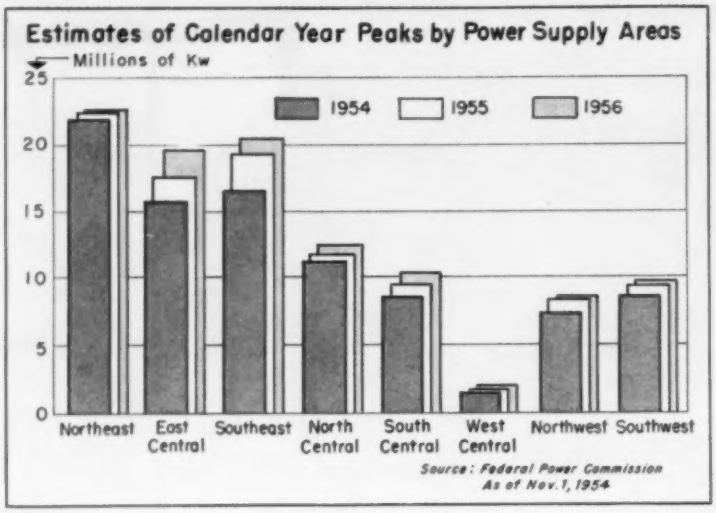
Standard construction practice in transmission line building has given new facility to this basic work. And through its network of offices and warehouses, Graybar contributes substantially to line building speed. Graybar's ability to deliver "packaged" crossarm assemblies for any line structure is a case in point. Fabricated and fitted with hardware to your specifications, the complete crossarm units can be delivered to the job at costs far less than those entailed in separate field handling. And, to complete the "package" Graybar Outside Construction Specialists are always on call to render technical help on out-of-the-ordinary problems. *Graybar Electric Company, Inc. Executive offices: Graybar Building, 420 Lexington Avenue, New York 17, N. Y.* 308-91

CALL GRAYBAR FIRST FOR...

GRAYBAR Everything Electrical

IN OVER 110 PRINCIPAL CITIES

STATISTICS



Power Statistics . . .

		Latest Month	Preceding Month	Year Ago	Annual Change %
Capacity	Nov.	101.12	100.01	89.81	12.6
Peak—Class I Systems	million kw	81.9	79.9	75.3	8.8
Estimated Dec. '55 Peak		96.1	96.2	98.3	− 2.2
Production—billion kwhr	Nov.	40.22	40.46	36.43	10.4
hydro		8.12	7.83	6.99	16.4
fuel		32.10	32.63	29.44	9.0
Sales—billion kwhr	Oct.	33.75	34.05	32.21	4.8
residential		9.70	9.76	8.70	11.5
commercial		6.40	6.69	5.62	13.9
industrial		15.24	15.00	15.56	− 2.1
other		2.41	2.60	2.33	3.4
Fuel Consumption	Nov.				
coal—million tons		10.70	10.34	10.19	3.5
oil—million barrels		5.82	5.32	6.91	−15.8
gas—billion cu ft		88.66	108.49	80.58	10.0
Net Income Class A & B Co's—$ million	Nov.	91.90	86.92	83.86	13.2
Residential Customers—millions		42.95	42.84	41.79	2.8
revenue per kwhr	12 mos.	2.70¢	2.70¢	2.75¢	− 1.8
avg kwhr per customer	ended	2,512	2,496	2,317	8.4
avg annual bill	Oct.	$67.82	$67.39	$63.72	6.4

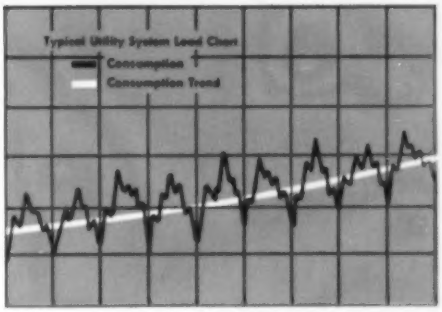
Business Statistics . . .

Indexes: 1947—49 = 100					
FRB Industrial Production	Dec.	128	130	124	3.2
ENR Construction Cost	Dec.	134.9	134.8	128.2	5.2
BLS Cost-of-living	Nov.	114.6	114.5	115.0	− 0.3
NEMA Sales	Nov.				
insulation materials		124	117	130	− 4.6
electric appliances		90	102	70	28.6
household refrigerators		47	51	35	34.3
Wholesale prices	Dec.				
motors and generators		121.7	121.7	124.3	− 2.1
transformers and regulators		128.1	128.1	128.1	.....
switchgear and fuses		135.3	135.3	135.1	0.1
GNP—annual rate—$ billion	3rd qtr	355.5	356.0	367.2	− 3.2

The best assurance of uninterrupted service from sunup to sunup is *dependable equipment.* Moloney has been building transformers to meet the needs of the electric utilities for over 58 years . . . transformers that have proven so serviceable, that the Moloney trademark has become the "Sign of Quality."

So, make it Moloney all along the line . . . power transformers in any Kva rating, load tap changers, regulating equipment, or distribution transformers . . . for you know that Moloney Transformers will serve you and your customers from sunup to sunup —year in and year out.

ME-59-1



Utility demand charts show that more and more electricity is being used around the clock and around the calendar.

MOLONEY ELECTRIC COMPANY

Power Transformers • Distribution Transformers • Step Voltage Regulators • Regulating Transformers • Load Tap Changing Transformers • Load Center Transformers • Unit Substations • Network Transformers • Constant Current Transformers • Capacitors • Transformers For Electronics

SALES OFFICES IN ALL PRINCIPAL CITIES • FACTORIES AT ST. LOUIS 20, MO. AND TORONTO, ONT., CANADA

Here's What System Operators Say About

Allis-Chalmers DISTRIBUTION REGULATORS...

"We increased revenue — and profits."

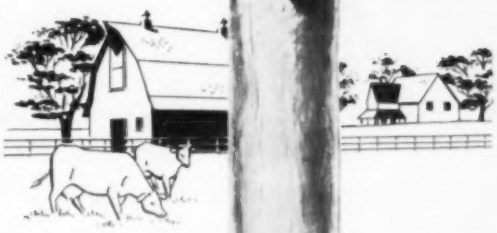
Because they maintain correct voltage regardless of cause of voltage drop, Allis-Chalmers distribution regulators assure system operators maximum profits from increased loads. Their narrow ± 1 volt band over a 20% range means that new appliances and machinery provide maximum service to the consumer — and maximum profits to the system.

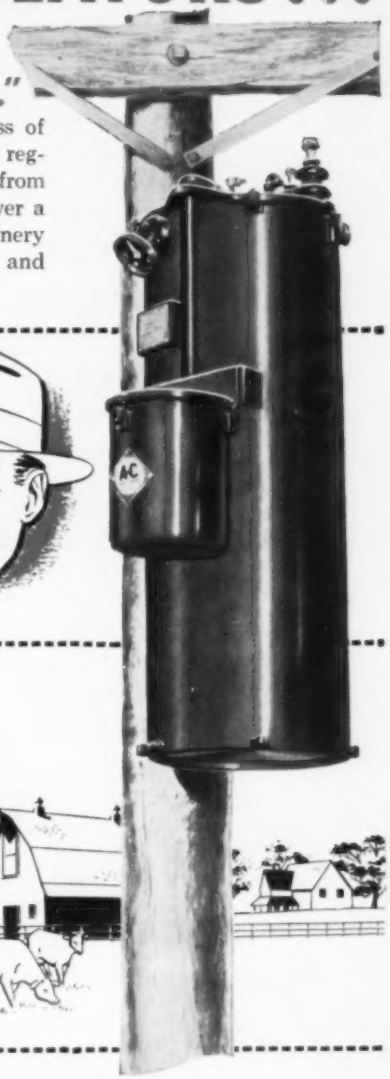
"We eliminated voltage complaints."

Adding load may actually mean adding maintenance crews and equipment unless you assure proper voltage levels. Allis-Chalmers distribution regulators provide an exceptionally flexible solution to voltage problems — they can be used again and again — even after feeders have been rebuilt — because they are so easy and so economical to reinstall.

"We get practically trouble-free service."

Ten years of operating experience has proved the economy and reliability of Allis-Chalmers distribution regulators. The first installation was on a Wisconsin rural system. Field operation has borne out the results of laboratory tests which showed that these rugged units can withstand millions of operations, equivalent to decades of service with little or no maintenance.





● Get all the facts on how Allis-Chalmers distribution regulators can increase revenue and profits, can improve customer satisfaction, and can eliminate problems caused by incorrect voltage. Call your nearest Allis-Chalmers district office or write Allis-Chalmers, Milwaukee 1, Wisconsin.

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